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MASSACHUSETTS
AGRICULTURAL COLLEGE

CATALOGUE, 1924-1925



MASSACHUSETTS
AGRICULTURAL COLLEGE
1924-1925
CATALOGUE

A.M.

THE M. A. C. BULLETIN AMHERST, MASSACHUSETTS

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THE SIXTY-SECOND ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

PART II.—CATALOGUE OF THE COLLEGE FOR 1924-1925



The Commonwealth of Massachusetts

MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST, November 29, 1924.

To the Commissioner of Education.

SIR:— On behalf of the trustees of the Massachusetts Agricultural College I have the honor to transmit herewith Part II of the sixty-second annual report of the trustees for the fiscal year ended November 29, 1924, this being the catalogue of the college.

Respectfully yours,

EDWARD M. LEWIS,
Acting President.

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Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. — *Act of Congress, July 2, 1862.*

This issue of the catalogue represents the status of the college for the current college year, with provisional announcement of courses of study and other matters for the year to follow. When deemed necessary, additional announcements are made in a supplementary bulletin, published in the spring.

The college reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

CALENDAR.

1924-1925.

Regular and Two-Year Courses.

1924.

September 10-13, Wednesday-Saturday . . .	Entrance Examinations
September 15, Monday, 1.30 P.M. . . .	Fall term begins for Freshmen
September 17, Wednesday, 1.30 P.M. . . .	Fall term begins for all except Freshmen; assembly
October 13, Monday	Holiday, observance of Columbus Day
November 26-December 1, Wednesday, 12 M.-Monday, 7.30 A.M.	Thanksgiving Recess
December 20, Saturday, 12 M.	Fall term ends
December 30, Tuesday, 7.30 A.M.	Winter term begins; chapel

1925.

January 1, Thursday	Holiday, New Year's Day
February 23, Monday	Holiday, observance of Washington's Birthday
March 21, Saturday, 12 M.	Winter term ends
March 30, Monday, 1 P.M.	Spring term begins
April 20, Monday	Holiday, observance of Patriot's Day
May 30, Saturday	Holiday, Memorial Day
June 13-15, Saturday-Monday	Commencement
June 18-20, Thursday-Saturday	Entrance examinations
September 9-12, Wednesday-Saturday	Entrance examinations
September 14, Monday	Fall term begins for Freshmen
September 16, Wednesday	Fall term begins for all except Freshmen; assembly

MASSACHUSETTS AGRICULTURAL COLLEGE.

HISTORY. — The Massachusetts Agricultural College was organized under the national land grant act of 1862. This legislation is also known as the Morrill act, the original bill having been framed by Justin Smith Morrill, Senator from Vermont, and its final enactment secured under his leadership. It provided that public lands be assigned to the several States and territories, the funds from the sale of which were to be used to establish and maintain colleges of agriculture and mechanic arts. The Massachusetts Agricultural College was among the first of these institutions established. When this act was passed the Massachusetts Institute of Technology was already organized, and the State of Massachusetts decided that the instruction in the mechanic arts should be at the institute, and that the new institution should confine its work to agriculture. On this account the Massachusetts Agricultural College has the unique distinction of being the only separate agricultural college in the country.

In 1863 the State of Massachusetts accepted the provisions of the Morrill act and incorporated the Agricultural College. The location at Amherst was selected only after long and careful study by the original Board of Trustees. The college was formally opened to students on the 2d of October, 1867, with a faculty of four teachers and with four wooden buildings.

The Massachusetts Legislature has granted money for the erection of practically all of the buildings now on the grounds. In view of the fact that the annual income from the original endowment has been only a few thousand dollars, it has been necessary for the State to assume large responsibility for the current expenses of the institution.

ORGANIZATION. — The college is a State institution, serving in the Department of Education and as such is subject to the laws governing and the rules applying to all State departments and institutions. The work of the college is directed by a board of eighteen trustees. Four of these are ex-officio members, — the Governor of the State, the Commissioner of Education, the Commissioner of Agriculture and the President of the college. The other fourteen members are appointed by the Governor, two each year, for terms of seven years. The immediate control of the institution is vested in the President of the college. The administrative officers, having supervision of the various departments of activity, are directly responsible to the President.

In carrying out its purpose the college has organized three distinct yet correlated types of work, — namely, research, resident instruction and extension service.

RESEARCH. — In 1882 Massachusetts provided for the establishment of an agricultural experiment station. This station, though on the college grounds and supported by the State, was without organic connection with the college. Under an act of Congress, passed in 1887, an agricultural experiment station was established and supported as a department of the college. For a time, therefore, Massachusetts had two experiment stations at the college. In 1895 these were combined, and the station reorganized as a department of the college. It is now supported by funds from both the State and the Federal government. In 1906 the Federal government largely increased its support on condition that the money thus provided should be used only for research. The station now receives about four-fifths of its support from the State.

The station is under the direct supervision of the Board of Trustees; the chief officer is the director, who is responsible to the President. It is organized into a

number of departments, all co-operating toward the betterment of agriculture. In most cases the heads of these departments are heads of corresponding departments in the college.

RESIDENT INSTRUCTION. — The college offers an education without tuition fee to any student who is a resident of Massachusetts and who meets the requirements for admission. Women are admitted on the same basis as are men. Students who are not residents of Massachusetts are required to pay a tuition fee. The chief aim of the institution, through its resident instruction, is to prepare men and women for the agricultural vocations. The term "agricultural vocations" is here used in its broadest sense. Courses are offered which give efficient training in various agricultural pursuits, such as general farming, dairying, management of estates, poultry husbandry, fruit growing, market gardening, floriculture, landscape gardening and forestry. Students are also trained for investigation in many sciences underlying the great agricultural industry, for teaching in agricultural colleges and high schools, and for scientific work in chemistry, entomology, botany and microbiology. Comprehensive courses in home making are now available for women.

Though training for the agricultural vocations is thus the chief concern of the college, students should find the course one that trains them admirably for pursuits in which the sciences are an essential preparation. The course of study aims also to combine an adequate general education with specialized technical and practical training.

FOUR-YEAR COURSES. — Twenty-nine teaching departments offer instruction in agriculture, horticulture, sciences, the humanities, rural social science and home making. A system of major courses permits the student to elect major work in one of sixteen departments, and to specialize in it and allied subjects for a period of two years. The degree of bachelor of science is granted on the satisfactory completion of the four years' work of collegiate grade.

SHORT COURSES. — In order to extend the advantages of the institution to those men and women who cannot or do not care to pursue the four-year course, various short courses are offered. Chief among these are a two-year course in practical agriculture, a summer school of agriculture and country life, and a winter school of agriculture.

GRADUATE SCHOOL. — The graduate school is organized to provide the necessary training for scientific leadership in agriculture and allied sciences. The degrees of master of agriculture, master of landscape architecture, master of science, doctor of agriculture and doctor of philosophy may be earned upon the completion of satisfactory study, research and thesis.

THE EXTENSION SERVICE. — The Extension Service is the organized educational agency of the college which serves the people of the State other than resident students. Its function is to make available to Massachusetts citizens useful and practical information in agriculture and home economics which is developed by the experiment station or the United States Department of Agriculture, and which is taught by the college to resident students. It is the recognized agency of the United States Department of Agriculture for teaching those who cannot attend college, and is a cooperative effort by the Department of Agriculture, the Massachusetts Agricultural College, and the County Extension Services.

The Extension Service uses many methods of work, among which are the following:

- Demonstrations.
- Publications.
- Correspondence Courses.
- Lectures.
- Exhibits.
- Extension Schools.
- Leader-training Groups.
- Boys' and Girls' Clubs in Agriculture and Home Economics.
- Agricultural News Letters.

Literature descriptive of these various services will be mailed on request. Information may also be secured from the county agricultural agents at the following addresses:

Berkshire County Extension Service, Howard Block, Pittsfield, Mass.
Bristol County Agricultural School, Segreganset, Mass.
Cape Cod Extension Service, Hyannis, Mass.
Essex County Agricultural School, Hathorne, Mass.
Franklin County Extension Service, Sheldon Block, Greenfield, Mass.
Hampden County Improvement League, 244 Main St., Springfield, Mass.
Hampshire County Extension Service, 59 Main St., Northampton, Mass.
Middlesex County Extension Service, 12 Moody St., Waltham, Mass.
Norfolk County Agricultural School, Walpole, Mass.
Plymouth County Extension Service, 106 Main St., Brockton, Mass.
Worcester County Extension Service, 11 Foster St., Worcester, Mass.

LOCATION AND EQUIPMENT. — The Agricultural College is located in the town of Amherst. The grounds comprise approximately 700 acres, lying about a mile north of the village center. The college has also a demonstration forest of 755 acres, located 6 miles north of the campus. The equipment of the college, both in buildings and facilities for instruction, is excellent. Amherst is 97 miles from Boston, and may be reached by the Central Massachusetts division of the Boston & Maine Railroad, or by the Central Vermont Railroad. Electric car lines connect Amherst with Northampton, Holyoke and Springfield.

MILITARY DRILL. — By Federal law military drill is required of all regular students attending the Massachusetts Agricultural College.

THE TRUSTEES.

Organization of 1924.

MEMBERS OF THE BOARD.

	TERM EXPIRES
CHARLES H. PRESTON of Danvers	1925
CARLTON D. RICHARDSON of West Brookfield	1925
DAVIS R. DEWEY of Cambridge	1926
JOHN F. GANNON of Pittsfield	1926
ARTHUR G. POLLARD of Lowell	1927
GEORGE H. ELLIS of West Newton	1927
ELMER D. HOWE of Marlborough ¹	1928
JOHN CHANDLER of Sterling Junction	1928
ATHERTON CLARK of Newton	1928
NATHANIEL I. BOWDITCH of Framingham	1929
WILLIAM WHEELER of Concord	1929
CHARLES A. GLEASON of North Brookfield	1930
JAMES F. BACON of Boston	1930
FRANK GERRETT of Greenfield	1931
HAROLD L. FROST of Arlington	1931

MEMBERS EX-OFFICIO.

His Excellency Governor CHANNING H. COX, *President of the Board of Trustees.*
KENYON L. BUTTERFIELD,² *President of the College.*
EDWARD M. LEWIS, *Acting President of the College.*
PAYSON SMITH, *State Commissioner of Education.*
ARTHUR W. GILBERT, *State Commissioner of Agriculture.*

OFFICERS OF THE TRUSTEES.

His Excellency Governor CHANNING H. COX of Boston, *President.*
CHARLES A. GLEASON of North Brookfield, *Vice-President.*
RALPH J. WATTS of Amherst, *Secretary.*
FRED C. KENNEY of Amherst, *Treasurer.*
CHARLES A. GLEASON of North Brookfield, *Auditor.*

STANDING COMMITTEES OF THE TRUSTEES.³

Committee on Finance.

CHARLES A. GLEASON, <i>Chairman.</i>	ARTHUR G. POLLARD.
GEORGE H. ELLIS.	CARLTON D. RICHARDSON.
NATHANIEL I. BOWDITCH.	ATHERTON CLARK.

Committee on Course of Study and Faculty.

WILLIAM WHEELER, <i>Chairman.</i>	PAYSON SMITH.
ELMER D. HOWE. ¹	DAVIS R. DEWEY.
JAMES F. BACON.	JOHN F. GANNON.

ARTHUR W. GILBERT.

¹ Died June 17, 1924; succeeded by John Chandler, appointed September 3, 1924.
² Resigned August 31, 1924; succeeded by Edward M. Lewis, Acting President.
³ The President of the College is ex-officio member of each committee.

Committee on Farm.

NATHANIEL I. BOWDITCH, *Chairman*.
FRANK GERRETT.

GEORGE H. ELLIS.
ARTHUR W. GILBERT.

CARLTON D. RICHARDSON.

Committee on Horticulture.

HAROLD L. FROST, *Chairman*.
CHARLES A. GLEASON.

ELMER D. HOWE.¹
ATHERTON CLARK.

CHARLES H. PRESTON.

Committee on Experiment Department.

CHARLES H. PRESTON, *Chairman*.
ARTHUR W. GILBERT.

ARTHUR G. POLLARD.
HAROLD L. FROST.

CARLTON D. RICHARDSON.

Committee on Buildings and Arrangement of Grounds.

GEORGE H. ELLIS, *Chairman*.
FRANK GERRETT.
WILLIAM WHEELER.

JAMES F. BACON.
CHARLES H. PRESTON.
ATHERTON CLARK.

Committee on Extension Service.

ELMER D. HOWE,¹ *Chairman*.
GEORGE H. ELLIS.
HAROLD L. FROST.

DAVIS R. DEWEY.
NATHANIEL I. BOWDITCH.
JOHN F. GANNON.

ARTHUR W. GILBERT.

¹ Died June 17, 1924; succeeded by John Chandler, appointed September 3, 1924.

OFFICERS OF THE INSTITUTION.

As of Nov. 1, 1924.

Officers of General Administration.

EDWARD M. LEWIS, A.M.	President's House.
Dean and Acting President of the College.	
HENRY S. GREEN, A.B., LL.D. ¹	Mount Pleasant.
Librarian of the College.	
SIDNEY B. HASKELL, B.Sc.	2 Mount Pleasant.
Director of the Experiment Station.	
FRED C. KENNEY	Mount Pleasant.
Treasurer of the College.	
WILLIAM L. MACHMER, A.M.	25 Amity Street.
Acting Registrar of the College.	
CHARLES E. MARSHALL, Ph.D.	44 Sunset Avenue.
Director of the Graduate School.	
RICHARD A. MELLEN, B.Sc.	25 Fearing Street.
Field Agent.	
ROLAND H. VERBECK, B.Sc.	99 Main Street.
Director of Short Courses.	
RALPH J. WATTS, B.Sc.	101 Butterfield Terrace.
Secretary of the College.	
JOHN D. WILLARD, B.A.	31 Lincoln Avenue.
Director of the Extension Service.	
BASIL B. WOOD, A.B.	The Davenport.
Librarian of the College.	

The Faculty of Instruction.

EDWARD M. LEWIS, A.M.	President's House.
Dean and Acting President of the College, Professor of Languages and Literature, Head of Department and Head of Division of Humanities.	
MAX F. ABELL, Ph.D.	North Amherst.
Assistant Professor of Farm Management.	
GEORGE W. ALDERMAN, B.A.	North Pleasant Street.
Instructor in Physics.	
CHARLES P. ALEXANDER, Ph.D.	120 Pleasant Street.
Assistant Professor of Entomology.	
EDGAR L. ASHLEY, A.M.	Amherst House.
Professor of German.	
LORIN E. BALL, B.Sc.	3 Allen Street.
Instructor in Physical Education.	
LUTHER BANTA, B.Sc.	Sunset Avenue.
Assistant Professor of Poultry Husbandry.	
MARY A. BARTLEY	50 Pleasant Street.
Instructor in Home Economics.	
ARTHUR B. BEAUMONT, Ph.D.	51 Amity Street.
Professor of Agronomy and Head of Department.	

¹ Retired Nov. 12, 1924.

EDWARD L. BIKE, B.Sc.	Sigma Phi Epsilon House.
Instructor in Physical Education.	
THOMAS BRADY, Jr., Captain, Cavalry, U. S. A.	Amherst House.
Assistant Professor of Military Science and Tactics.	
ALEXANDER E. CANCE, Ph.D.	9 Fearing Street.
Professor of Agricultural Economics and Head of Department.	
MORTON H. CASSIDY, B.Sc.	The Apiary.
Assistant Professor of Beekeeping.	
JOSEPH S. CHAMBERLAIN, Ph.D.	Mount Pleasant.
Professor of Organic and Agricultural Chemistry.	
WALTER W. CHENOWETH, M.Sc.	North Amherst.
Professor of Horticultural Manufactures and Head of Department.	
ORTON L. CLARK, B.Sc.	12 College Street.
Assistant Professor of Botany.	
G. CHESTER CRAMPTON, Ph.D.	Fernald Hall.
Professor of Insect Morphology.	
WILLIAM H. DAVIS, Ph.D.	12 Nutting Avenue.
Assistant Professor of Botany.	
LLEWELLYN L. DERBY	Amherst House.
Instructor in Physical Education.	
LAWRENCE S. DICKINSON, B.Sc.	2 Farview Way.
Assistant Professor of Horticulture.	
BROOKS D. DRAIN, B.Sc.	50 Pleasant Street.
Assistant Professor of Pomology.	
HENRY T. FERNALD, Ph.D.	44 Amity Street.
Professor of Entomology, Head of Department, Chairman of Division of Science.	
JAMES A. FOORD, M.Sc.Agr.	54 Lincoln Avenue.
Professor of Farm Management and Head of Department, Acting Head, Division of Agriculture.	
ARTHUR P. FRENCH, M.Sc.	9 Phillips Street.
Instructor in Pomology.	
PRENTISS FRENCH, A.B., M.L.A.	5 Fearing Street.
Assistant Professor of Landscape Gardening.	
GEORGE E. GAGE, Ph.D.	The Davenport.
Professor of Animal Pathology and Head of Department of Veterinary Science and Animal Pathology.	
MARY E. M. GARVEY, B.Sc.	29 South Prospect Street.
Instructor in Microbiology.	
GUY V. GLATFELTER, M.Sc.	10 Kendrick Place.
Assistant Professor of Animal Husbandry.	
HARRY N. GLICK, Ph.D.	27 Fearing Street.
Professor of Agricultural Education.	
HELENA T. GOESSMANN, M.Ph.	35 South Pleasant Street.
Instructor in English.	
CLARENCE E. GORDON, Ph.D.	38 Lincoln Avenue.
Professor of Zoölogy and Geology, and Head of Department.	
HAROLD M. GORE, B.Sc.	Plainville Road.
Assistant Professor of Physical Education.	
JOHN C. GRAHAM, B.Sc.Agr.	68 Lincoln Avenue.
Professor of Poultry Husbandry and Head of Department.	
LAURENCE R. GROSE, A.B., M.F.	32 Amity Street.
Professor of Forestry and Head of Department.	
CHRISTIAN I. GUNNESS, B.Sc.	105 Butterfield Terrace.
Professor of Rural Engineering and Head of Department.	
RAYMOND HALLIDAY, B.A.	The Davenport.
Instructor in French.	
MARGARET HAMLIN, B.A.	12 North East Street.
Agricultural Counsellor for Women.	

ARTHUR K. HARRISON	8 Allen Street.
Assistant Professor of Landscape Gardening.	
CURRY S. HICKS, B.Pd.	The Davenport.
Professor of Physical Education and Hygiene, and Head of Department.	
Mrs. CURRY S. HICKS ¹	The Davenport.
Instructor in Physical Education.	
DWIGHT HUGHES, Jr., Captain, Cavalry, U. S. A.	The Davenport.
Assistant Professor of Military Science and Tactics.	
BELDING F. JACKSON, B.Sc.	Belchertown.
Instructor in English.	
WILLARD P. JONES, B.Sc.	East Experiment Station.
Instructor in Agronomy.	
HENRY F. JUDKINS, B.Sc.	103 Butterfield Terrace.
Professor of Dairying and Head of Department.	
ARTHUR N. JULIAN, A.B.	4 Farview Way.
Assistant Professor of German.	
HELEN KNOWLTON, A.M.	50 Pleasant Street.
Assistant Professor of Home Economics.	
HERMAN KOBBE, Major, Cavalry, U. S. A.	35 South Pleasant Street.
Professor of Military Science and Tactics, and Head of Department.	
MARSHALL O. LANPHEAR, B.Sc.	4 Nutting Avenue.
Assistant Professor of Agronomy.	
JOHN B. LENTZ, A.B., V.M.D.	3 Dana Street.
Assistant Professor of Veterinary Science and College Veterinarian.	
JOSEPH B. LINDSEY, Ph.D.	47 Lincoln Avenue.
Goessmann Professor of Agricultural Chemistry and Head of Department.	
WILLIAM L. MACHMER, A.M.	25 Amity Street.
Professor of Mathematics, Assistant Dean and Acting Registrar.	
ALEXANDER A. MACKIMMIE, A.M.	North Amherst.
Professor of French.	
CHARLES E. MARSHALL, Ph.D.	44 Sunset Avenue.
Professor of Microbiology and Head of Department.	
FREDERICK A. McLAUGHLIN, B.Sc.	4 Nutting Avenue.
Assistant Professor of Botany.	
CHARLES A. MICHELS, M.Sc.	70 Lincoln Avenue.
Assistant Professor of Agronomy.	
FRANK C. MOORE, A.B.	10 Allen Street.
Assistant Professor of Mathematics.	
RICHARD T. MULLER, M.Sc.	45 East Pleasant Street.
Assistant Professor of Floriculture.	
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Instructor in Microbiology.	
JOHN B. NEWLON	North Amherst.
Instructor in Rural Engineering.	
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Professor of Botany and Head of Department.	
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Professor of Mathematics and Head of Department.	
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Professor of English.	
JOHN W. PATTON, M.Sc., D.V.M. ²	21 Pleasant Street.
Assistant Professor of Poultry Husbandry.	
HARLOW L. PENDLETON, B.Sc.	Fearing Street.
Instructor in Dairying.	
CHARLES A. PETERS, Ph.D.	Sunset Place.
Professor of Inorganic and Soil Chemistry.	
ARTHUR W. PHILLIPS, A.M.	[16 North] Prospect Street.
Instructor in Chemistry.	

¹ Temporary.

² Temporary, one year.

WAYLAND R. PORTER, B.Sc.	Belchertown Road.
Instructor in Mathematics.	
WALTER E. PRINCE, A.M.	27 Amity Street.
Assistant Professor of English.	
MARION C. PULLEY, B.Sc.	68 Lincoln Avenue.
Instructor in Poultry Husbandry.	
GEORGE F. PUSHEE	North Amherst.
Instructor in Rural Engineering.	
GEORGE J. RALEIGH, B.Sc.	7 East Pleasant Street.
Instructor in Pomology.	
FRANK PRENTICE RAND, A.M.	3 Mount Pleasant.
Assistant Professor of English.	
VICTOR A. RICE, M.Agr.	10 Woodside Avenue.
Assistant Professor of Animal Husbandry.	
GORDON C. RING, A.M.	42 Lincoln Avenue.
Instructor in Zoology.	
WILLIAM F. ROBERTSON, B.Sc.	33 East Pleasant Street.
Instructor in Horticultural Manufactures.	
ROLAND W. ROGERS, B.Sc., M.L.A.	32 North Prospect Street.
Assistant Professor of Horticulture.	
WILLIAM C. SANCTUARY, B.Sc. ¹	23 Woodside Avenue.
Professor of Poultry Husbandry.	
DONALD W. SAWTELLE, M.Sc.	5 Allen Street.
Assistant Professor of Agricultural Economics.	
FRED C. SEARS, M.Sc.	Mount Pleasant.
Professor of Pomology and Head of Department.	
PAUL SEREX, Jr., Ph.D.	Lincoln Avenue.
Assistant Professor of Chemistry.	
NEWELL L. SIMS, Ph.D. ¹	16 North Prospect Street.
Professor of Rural Sociology.	
EDNA L. SKINNER, B.Sc.	50 Lincoln Avenue.
Professor of Home Economics, Head of Department, Adviser of Women.	
HAROLD W. SMART, LL.B. ²	Lincoln Block.
Instructor in Farm Law.	
RICHARD W. SMITH, Jr., B.Sc.	17 Fearing Street.
Instructor in Dairying.	
GRANT B. SNYDER, B.Sc.Agr.	Lincoln Block.
Instructor in Vegetable Gardening.	
JAMES L. STRAHAN, M.Sc.	50 Amity Street.
Assistant Professor of Rural Engineering.	
CHARLES H. THAYER	South East Street.
Instructor in Agronomy.	
CLARK L. THAYER, B.Sc.	North Amherst.
Professor of Floriculture and Head of Department.	
WESTON C. THAYER, B.Sc.	14 Nutting Avenue.
Instructor in Animal Husbandry.	
CHARLES H. THOMPSON, M.Sc.	Mount Pleasant.
Professor of Horticulture.	
RAY E. TORREY, Ph.D.	Inwood.
Assistant Professor of Botany.	
RALPH A. VAN METER, B.Sc.	7 East Pleasant Street.
Professor of Pomology.	
PAUL W. VIETS	Sunset Avenue.
Supervisor of Placement Training.	
FRANK A. WAUGH, M.Sc.	Campus.
Professor of Landscape Gardening, Head of Department, Head of Division of Horticulture.	

¹ On leave of absence for one year.² Temporary for one year.

WINTHROP S. WELLES, B.Sc.	23 Lincoln Avenue.
Professor of Agricultural Education and Head of Department.	
CHESTER H. WERKMAN, Ph.D.	23 Woodside Avenue.
Assistant Professor of Microbiology.	
T. GEORGE YAXIS, M.Sc.	5 Sunset Avenue.
Assistant Professor of Dairying.	
HUBERT W. YOUNT, M.Sc.	9 Fearing Street.
Instructor in Agricultural Economics.	
Professor of Animal Husbandry and Head of Department.	
Professor of Economics and Sociology and Head of Department.	
Professor of Physics and Head of Department.	
Professor of Physics.	
Professor of Rural Sociology and Head of Department.	
Assistant Professor of Vegetable Gardening.	

The Experiment Station Staff.

EDWARD M. LEWIS, A.M.	President's House.
Dean and Acting President of the College.	
SIDNEY B. HASKELL, B.Sc.	2 Mount Pleasant.
Director.	
JAMES R. ALCOCK	North Amherst.
Laboratory Assistant in Animal Nutrition.	
HARRY L. ALLEN	89 Main Street.
Laboratory Assistant in Chemistry.	
PAUL J. ANDERSON, Ph.D.	25 Lincoln Avenue.
Research Professor of Botany.	
JOHN G. ARCHIBALD, M.Sc.	North Amherst.
Assistant Research Professor of Chemistry.	
JOHN S. BAILEY, M.Sc.	13½ Amity Street.
Investigator in Pomology.	
ALYN S. BALL	94 Main Street.
Laboratory Assistant in Botany.	
ARTHUR B. BEAUMONT, Ph.D.	51 Amity Street.
Professor of Agronomy and Head of Department.	
ARTHUR I. BOURNE, B.A.	12 East Pleasant Street.
Assistant Research Professor of Entomology.	
ALEXANDER E. CANCE, Ph.D.	9 Fearing Street.
Professor of Agricultural Economics and Head of Department.	
WALTER W. CHENOWETH, M.Sc.	North Amherst.
Professor of Horticultural Manufactures and Head of Department.	
ORTON L. CLARK, B.Sc.	12 College Street.
Assistant Professor of Botany.	
WILLIAM L. DORAN, M.Sc.	Waltham.
Assistant Research Professor of Botany.	
F. ETHEL FELTON, B.A.	The Davenport.
Editorial Assistant.	
HENRY T. FERNALD, Ph.D.	44 Amity Street.
Professor of Entomology and Head of Department.	
JAMES A. FOORD, M.Sc.Agr.	54 Lincoln Avenue.
Professor of Farm Management and Head of Department.	
HENRY J. FRANKLIN, Ph.D.	East Wareham.
Research Professor in charge of Cranberry Station.	

GEORGE E. GAGE, Ph.D.	The Davenport.
Professor of Animal Pathology and Head of Department of Veterinary Science and Animal Pathology.	
EDWIN F. GASKILL, B.Sc.	North Pleasant Street.
Assistant to the Director.	
GERALD M. GILLIGAN, B.Sc.	9 Phillips Street.
Investigator in Chemistry.	
JOHN C. GRAHAM, B.Sc.	68 Lincoln Avenue.
Professor of Poultry Husbandry and Head of Department.	
CHRISTIAN I. GUNNESS, B.Sc.	105 Butterfield Terrace.
Professor of Rural Engineering and Head of Department.	
FRANK A. HAYS, Ph.D.	41 Lincoln Avenue.
Research Professor of Poultry Husbandry.	
EDWARD B. HOLLAND, Ph.D.	28 North Prospect Street.
Research Professor of Chemistry.	
LORIAN P. JEFFERSON, M.A.	The Davenport.
Assistant Research Professor of Agricultural Economics.	
CARLETON P. JONES, M.Sc.	8 Nutting Avenue.
Assistant Research Professor of Chemistry.	
JOHN P. JONES, M.Sc.	Tillson Court.
Assistant Research Professor of Agronomy.	
HENRY F. JUDKINS, B.Sc.	103 Butterfield Terrace.
Professor of Dairying and Head of Department.	
DONALD S. LACROIX, B.Sc.	East Wareham.
Investigator in Agriculture.	
JOSEPH B. LINDSEY, Ph.D.	47 Lincoln Avenue.
Vice-Director, Professor of Chemistry and Head of Department.	
CHARLES E. MARSHALL, Ph.D.	44 Sunset Avenue.
Professor of Microbiology and Head of Department.	
GLADYS I. MINER	1 Allen Street.
Curator, Department of Botany.	
FRED W. MORSE, M.Sc.	40 Pleasant Street.
Research Professor of Chemistry.	
A. VINCENT OSMUN, M.Sc.	16 Northampton Road.
Professor of Botany and Head of Department.	
JOHN E. OSTRANDER, A.M., C.E.	33 North Prospect Street.
Meteorologist.	
NORMAN J. PYLE, V.M.D.	5 Dana Street.
Assistant Research Professor of Avian Pathology.	
RUBY SANBORN, A.B.	45 Pleasant Street.
Investigator in Poultry Husbandry.	
FRED C. SEARS, M.Sc.	Mount Pleasant.
Professor of Pomology and Head of Department.	
JACOB K. SHAW, Ph.D.	5 Farview Way.
Research Professor of Pomology.	
VICTOR A. TIEDJENS, M.Sc.	Waltham.
Assistant Research Professor of Vegetable Gardening.	
FRANK A. WAUGH, M.Sc.	Campus.
Head of Division of Horticulture.	
CHESTER H. WERKMAN, Ph.D.	23 Woodside Avenue.
Assistant Professor of Microbiology.	
HAROLD E. WILSON	15 Phillips Street.
Laboratory Assistant in Pomology.	
HARLAN N. WORTHLEY, M.Sc.	Tillson Court.
Assistant Professor of Entomology.	

Investigator in Botany.

Control Service Staff.

PATRICK E. BRANSFIELD, B.A.	14 Nutting Avenue.
Analyst.	
GEORGE B. DALRYMPLE	29 Main Street.
Analyst.	
HENRI D. HASKINS, B.Sc.	Easthampton.
Official Chemist, Fertilizer Control.	
JAMES T. HOWARD	7 Phillips Street.
Inspector.	
FRANK J. KOKOSKI, B.Sc.	Northampton Road.
Analyst.	
JAMES J. McDERMOTT	7 Woodside Avenue.
Technical Assistant.	
ALICE H. NORCROSS	Abigail Adams House.
Analyst.	
JOHN J. SMITH	9 Phillips Street.
Collector of Blood Samples.	
PHILIP H. SMITH, M.Sc.	102 Main Street.
Official Chemist, Feed Control.	
LEWELL S. WALKER, B.Sc.	19 Phillips Street.
Assistant Official Chemist, Fertilizer Control.	

Extension Service Staff.

EDWARD M. LEWIS, A.M.	President's House.
Dean and Acting President of the College.	
JOHN D. WILLARD, B.A.	31 Lincoln Avenue.
Director.	
JOHN B. ABBOTT, M.Sc.	31 North Prospect Street.
Extension Professor of Agronomy.	
FAYETTE H. BRANCH, B.Sc.	31 East Pleasant Street.
Extension Professor of Farm Management.	
WILLIAM R. COLE	5 East Pleasant Street.
Assistant Extension Professor of Horticultural Manufactures.	
JOHN A. CRAWFORD, B.Sc.	53 Lincoln Avenue.
Extension Editor.	
GEORGE L. FARLEY, M.Sc.	61 Amity Street.
State Club Leader.	
CLIFFORD J. FAWCETT, B.Sc.	70 Lincoln Avenue.
Extension Professor of Animal Husbandry.	
ROBERT D. HAWLEY, B.Sc.	South Amherst.
Supervisor of Extension Schools and Exhibits.	
WILLIAM F. HOWE	North Amherst.
Assistant State Club Leader.	
RAY M. KOON, M.Sc.	Waltham.
Extension Professor of Vegetable Gardening.	
WILLIAM P. B. LOCKWOOD, M.Sc.	West Newton.
Extension Professor of Dairying.	
ROBERT J. McFALL, Ph.D.	20 Spring Street.
Extension Professor of Agricultural Economics.	
WILLIAM C. MONAHAN, B.Sc.	8 Kellogg Avenue.
Extension Professor of Poultry Husbandry.	
EARLE H. NODINE, B.Sc.	21 Woodside Avenue.
Extension Instructor in charge of Poultry Club Work.	
SUMNER R. PARKER, B.Sc.	South Amherst.
Supervisor of County Agent Projects.	
RALPH W. REDMAN, B.Sc.	3 Hallock Street.
Assistant Director.	

LUCILLE W. REYNOLDS, B.Sc.	9 Phillips Street.
State Leader of Home Demonstration Agents.	
WILBUR H. THIES, B.Sc.	50 Pleasant Street.
Assistant Extension Professor of Pomology.	
MARION L. TUCKER, B.Sc.	87 Pleasant Street.
Assistant Extension Professor of Home Economics.	
MILDRED L. WOOD, A.B.	87 Pleasant Street.
Assistant Extension Professor of Nutrition.	
HARRIET M. WOODWARD, B.Sc.	87 Pleasant Street.
Assistant State Club Leader.	

Assistant Extension Professor of Landscape Gardening.

The Library Staff.

HENRY S. GREEN, A.B., LL.D. ¹	Mount Pleasant.
Librarian.	
BASIL B. WOOD, A.B.	The Davenport.
Librarian.	
LENA V. CHAPMAN	77 South Pleasant Street.
Assistant in charge of circulation.	
ETHEL A. GREEN, A.M.	Mount Pleasant.
Library Assistant.	
KATHARINE POWELL	9 Amity Street.
Department Librarian.	
BESSIE M. WEYMOUTH	19 Main Street.
Cataloguer.	

Other Officers.

BALDASSAROS E. A. BOVENZI	61 Amity Street.
Engineer.	
JOHN K. BROADFOOT	130 Pleasant Street.
Assistant to the Treasurer.	
AVIS P. CHRISTOPHER	Infirmary.
Resident Nurse.	
LAWRENCE S. DICKINSON, B.Sc.	2 Farview Way.
Superintendent of Grounds.	
LULU DIETHER	Draper Hall.
Manager of the Dining Hall.	
SAMUEL C. HUBBARD	North Amherst.
Foreman, Department of Floriculture.	
CLARENCE A. JEWETT	112 Pleasant Street.
Superintendent of Buildings.	
JOHN J. LEE	38 Cottage Street.
Assistant to the Military Detail.	
Mrs. MARY MACRAE	Infirmary.
Matron.	
Mrs. MARIE B. MARSH	Abigail Adams House.
Matron.	
URAL V. MARTIN	79 Main Street.
Curator, Goessmann Laboratory.	
WILLIAM E. MARTIN	5 Phillips Street.
Laboratory Assistant, Department of Horticultural Manufactures.	
ENOS J. MONTAGUE, B.Sc.	Campus.
Farm Superintendent.	
ADELBERT SHEFFIELD	North Amherst.
Superintendent of Dairy Manufactures.	

¹ Retired Nov. 12, 1924.

Staff employed for Work for Federal Board for Vocational Education.

GEORGE L. GOODRIDGE, B.Sc.	463 Lebanon Street, Melrose.
Supervisor of Agricultural Projects.	
FRANK L. HANNAFORD	44 Locust Street, Danvers.
Supervisor of Agricultural Projects.	
ROBERT V. MITCHELL	Taunton, Mass.
Supervisor of Agricultural Projects.	
HAROLD F. WILLIAMSON, B.Sc.Agr.	8 Kellogg Avenue.
Supervisor of Agricultural Projects.	

Graduate Assistants.

THEODORE T. AYERS, B.Sc.	Clark Hall.
Department of Botany.	
ELEANOR F. CHASE, B.Sc.	Abigail Adams House.
Department of Chemistry.	
MARTIN E. CUPERY, A.B.	West Experiment Station.
Department of Chemistry.	
MARY J. FOLEY, B.Sc.	3 South Prospect Street.
Department of Agricultural Economics.	
JAMES GIBBARD, Jr., B.S.A.	North Amherst.
Department of Microbiology.	
HENRY LOUWSMA, A.B.	69 Lincoln Avenue.
Department of Chemistry.	
HARRY T. MORTENSEN, B.Sc.	Sunderland.
Department of Microbiology.	
GORDON P. PERCIVAL, B.Sc.	90 Pleasant Street.
Department of Chemistry.	
ALWYN C. SESSIONS, B.Sc.	3 Nutting Avenue.
Department of Agronomy.	
HAROLD H. SHEPARD, B.Sc.	120 Pleasant Street.
Department of Entomology.	
KENNETH B. SIMMONS, B.Sc.	83 Pleasant Street.
Department of Landscape Gardening.	
ORMAN E. STREET, B.Sc.	3 Nutting Avenue.
Department of Agronomy.	
ALEXANDER H. SUMBARDO, B.S.Agr.	Poultry Plant.
Department of Poultry Husbandry.	
DENIS R. A. WHARTON, B.S.A.	5 Sunset Avenue.
Department of Microbiology.	
GUS C. WOFFORD, B.Sc.	83 Pleasant Street.
Department of Landscape Gardening.	

STANDING COMMITTEES OF THE FACULTY.

1924-1925.

Commencement.

Professor THAYER.
Treasurer KENNEY.
Secretary WATTS.
Mr. S. R. PARKER.
Asst. Professor CLARK.

Course of Study.

Acting President LEWIS.
Professor WAUGH.
Professor FERNALD.
Professor OSTRANDER.
Professor MARSHALL.
Professor CHAMBERLAIN.
Professor FOORD.
Professor WELLES.
Professor GLICK.
Asst. Professor JULIAN.

Discipline.

Professor MACKIMMIE.
Professor MACHMER.
Professor CHENOWETH.
Professor HICKS.
Professor GUNNESS.

Employment.

Professor JUDKINS.
Treasurer KENNEY.
Secretary WATTS.
Professor THAYER.

Academic Activities Board.

Professor WAUGH.
Asst. Professor WORTHLEY.

Entrance Examinations and Admission.

Professor MACHMER.
Professor PATTERSON.
Professor OSMUN.
Professor ASHLEY.
Professor GLICK.

Health and Sanitation.

Professor MARSHALL.
Treasurer KENNEY.
Professor GAGE.
Professor HICKS.
Miss SKINNER.

Library.

Professor MARSHALL.
Professor PATTERSON.
Professor CANCE.
Mr. WOOD.

Scholarship.

Acting President LEWIS.
Professor MACHMER.
Professor PETERS.
Professor MACKIMMIE.
Professor PATTERSON.
Professor HICKS.
Asst. Professor RAND.
Asst. Professor TORREY.
Asst. Professor RICE.

Student Life.

Professor PATTERSON.
Secretary WATTS.
Professor SEARS.
Professor MACKIMMIE.
Professor THAYER.
Professor VAN METER.

Athletic Board.

Professor MACHMER.
Professor OSMUN.
Asst. Professor RICE.

ADMISSION.

A. APPLICATION FOR ADMISSION.

Correspondence concerning admission should be addressed to the registrar.

Every applicant for admission to the college must be at least sixteen years old, and must present to the registrar proper testimonials of character, which, whenever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege at least one month before the date of the examination. Blanks for such application may be obtained by addressing the registrar of the college. All entrance credentials must be in the hands of the registrar before the applicant can matriculate.

B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from a secondary school will be accepted.

CERTIFICATES. — The Massachusetts Agricultural College is affiliated with the New England College Entrance Certificate Board. Therefore certificates of admission will be accepted from schools approved by the Board. Certificates of admission will also be accepted from any Massachusetts school listed as class "A" by the State Department of Education, but not included in the approved lists of the New England College Entrance Certificate Board. Principals of schools in New England who desire the certificate privilege should address the secretary of the Board, Professor Frank W. Nicolson, Wesleyan University, Middletown, Conn. Certificates from schools outside of New England may be received if those schools are on the approved list of the leading colleges of the section in which the school in question is located.

The credentials of the Board of Regents of the State of New York are accepted as satisfying the entrance requirements of this college when offered subject for subject.

Certificates in order to be accepted must present in the prescribed and restrictive elective groups at least three of the necessary fourteen and one-half credits. It is to be understood, however, that responsibility for certification in either elementary French, elementary German, English 1 or English 2, Latin A, Greek A or algebra must be assumed by one school, if the candidate has received his preparation in any one subject named above in more than one school. Subjects lacking on certificate (except for the permitted number of conditions) must be made up at the time of the examinations for admission.

SPECIAL CERTIFICATE ARRANGEMENT FOR STUDENTS FROM AGRICULTURAL SCHOOLS. — Superior graduates of Vocational Schools of Agriculture in Massachusetts may be accepted for the Degree of Vocational Agriculture provided:

(a) they are unqualifiedly recommended by the Vocational Division of the State Department of Education;

(b) that they can present at least $14\frac{1}{2}$ units of certified entrance credits.

Graduates of Vocational Agricultural Departments in Massachusetts High Schools may be admitted to the same degree course provided they present $14\frac{1}{2}$ certified units of work. At least $7\frac{1}{2}$ units must be in subjects listed in the "prescribed" and "restricted elective" groups certified to by the High School Principal in the regular way. The other 7 units will be accepted for work done in the

Agricultural Department and approved both as to quality and quantity by the State Department of Vocational Education.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the registrar of the college.

EXAMINATIONS. — The examination in each subject may be oral or written, or both. The standard required for passing an examination for admission is 65 per cent. Conditions to the amount of two units will be allowed.

Entrance examination for admission to the Massachusetts Agricultural College will be held at the following centers: —

In June Amherst, Department of Physics building.
 Massachusetts Institute of Technology,
 Cambridge, Mass.
 Worcester, Worcester Polytechnic Institute.

In September Amherst, Department of Physics building.

Please note that September examinations are held in Amherst only.

Schedule for Entrance Examinations June 18-20, 1925.

First Day.

8.30 A.M. Algebra.
 10.30 A.M. Chemistry.
 2.00 P.M. History (ancient, medieval and modern, English, general, United States and Civics).

Second Day.

8.30 A.M. English 1 and 2.
 11.30-12.30 M. Botany.
 2.00 P.M. Plane Geometry.
 3.30 P.M. Physics.

Third Day.

8.30 A.M. French, German, Spanish, required and elective.
 1.00 P.M. Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

Schedule for Entrance Examinations September 9-12, 1925.

First Day.

1.15-5.00 P.M. Greek, elementary and intermediate.

Second Day.

8.30 A.M. Algebra.
 10.30 A.M. Chemistry.
 2.00 P.M. History (ancient, medieval and modern, English, general, United States and Civics).

Third Day.

8.30 A.M. English 1 and 2.
 11.30-12.30 M. Botany.
 2.00 P.M. Plane Geometry.
 3.30 P.M. Physics.

Fourth Day.

8.30 A.M. French, German, Spanish, required and elective.
 1.00 P.M. Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

C. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-year high school course, or its equivalent, and are stated in terms of units. The term unit means the equivalent of at least four recitations a week for a school year.

Fourteen and one-half units must be offered for admission in accordance with the entrance requirements as stated below. Entrance credits gained either by certificate or by examination will hold good for one year.

Entrance Requirements.

1. *Prescribed.* — The following units are prescribed: —

English 1	.	.	.	.	.	.	.	.	.	.	.	1½
English 2	.	.	.	.	.	.	.	.	.	.	.	1½
A foreign language	.	.	.	.	.	.	.	.	.	.	.	2
Algebra	.	.	.	.	.	.	.	.	.	.	.	1½
Plane geometry	.	.	.	.	.	.	.	.	.	.	.	1
												—
												7½

2. *Restricted Electives.* — Three units to be selected from —

Science	.	.	.	.	.	.	.	.	.	.	.	1, 2 or 3
History (American history and civics included)	.	.	.	.	.	.	.	.	.	.	.	1, 2 or 3
A second foreign language	.	.	.	.	.	.	.	.	.	.	.	2 or 3
Additional work, in first foreign language	.	.	.	.	.	.	.	.	.	.	.	1 or 2

3. *Free Margin.* — Free margin of four units to consist of any substantial work (including agriculture, general science and a fourth year of English) for which credit of not less than one-half unit earned in one year is given toward a secondary school diploma.

“Units presented in the free margin group in subjects not included in the examination schedule may be offered only by certificate.”

4. One unit of history must be offered in either the restricted electives or the free margin.

5. If elementary algebra and plane geometry are counted as three units, the total requirement will be fifteen units.

6. Both the credits under the prescribed group and the restricted elective group must be presented either by certificate from an approved school or by examination, or by a combination of both.

The following is a list of subjects in which the entrance credits must be offered in the prescribed and restricted elective groups: —

Mathematics and Science.

Botany ¹	.	.	.	.	.	.	.	.	.	.	.	½ or 1
Chemistry ¹	.	.	.	.	.	.	.	.	.	.	.	1
Algebra	.	.	.	.	.	.	.	.	.	.	.	1½
Plane geometry	.	.	.	.	.	.	.	.	.	.	.	1
Solid geometry	.	.	.	.	.	.	.	.	.	.	.	½
Trigonometry	.	.	.	.	.	.	.	.	.	.	.	½
Physics ¹	.	.	.	.	.	.	.	.	.	.	.	1
Geology	.	.	.	.	.	.	.	.	.	.	.	½
Physical geography	.	.	.	.	.	.	.	.	.	.	.	½
Physiology	.	.	.	.	.	.	.	.	.	.	.	½
Zoölogy ¹	.	.	.	.	.	.	.	.	.	.	.	½

¹ Note-book required as part of the preparation will be credited as part of the examination.

History.

Ancient	1
Medieval and modern	1
English	1
General	1
United States and civics	1

English.

English 1	1½
English 2	1½

Foreign Language.

Elementary French	2
Elementary German	2
Elementary Spanish	2
Elementary Latin	2
Elementary Greek ¹	2
Intermediate French	1
Intermediate German	1
Intermediate Spanish	1
Intermediate Latin	1
Intermediate Greek ¹	1
Advanced French	1
Advanced German	1
Advanced Spanish	1
Advanced Latin	1

No applicant deficient in both algebra and plane geometry will be admitted.

PRESENTATION OF NOTE-BOOKS.—The keeping of a note-book is required as part of the preparation in those subjects indicated.

Candidates presenting themselves for examination in such subjects must present at the same time the required note-book, properly certified by the principal. Candidates presenting such subjects on certificates should not present note-books, but their certificates must state that note-books have been satisfactorily completed.

D. STATEMENT OF PREPARATION REQUIRED FOR ADMISSION.

AGRICULTURE.—Entrance credit in agriculture is granted on the following basis:—

I. The Massachusetts Agricultural College accepts a maximum of four credits in agriculture from any secondary or county agricultural high school in Massachusetts offering work in that subject, provided evidence of such work having been done is submitted on a principal's statement, as is indicated in the "free margin" group.

II. In high schools organizing agricultural club work under the supervision and rules of the junior extension service of the college, one credit is granted for each full year of work performed under the following plan:—

Work of the Winter Term.—(a) The study of textbooks such as are suitable for secondary school instruction in agriculture.

(b) Course of Study: A general outline of suggested topics for study.

(c) Visits by a representative of the Massachusetts Agricultural College for observation, counsel and advice in regard to kind and amount of work being done in agriculture.

¹ Examination in September only.

(d) Formation of an agricultural club with officers from among its own members, meeting once a month under local supervision of some one authorized to act for the school authorities.

Work of the Spring Term. — Same in general form as winter term.

Work of the Summer Term. — An approved project conforming to the rules of some one or more of the agricultural clubs of the junior extension service of the Massachusetts Agricultural College.

Work of the Fall Term. — (a) An exhibit of work.

(b) Reports and story of achievement submitted to the junior extension service of the college.

The maximum number of credits in agriculture is four.

BOTANY. — For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary textbook study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Stevens' "Introduction to Botany" and Bergin & Davis' "Principles of Botany." A note-book containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit, and this note-book must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

CHEMISTRY. — The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from any standard textbook, with laboratory work on the properties of the common elements and their simpler compounds. No particular work is prescribed. The keeping of a note-book is required.

Students who do not take chemistry in the preparatory school begin the subject in college, and are required to do extra work during the first two terms, as outlined under chemistry, courses 1 and 2, page 64.

MATHEMATICS. — (a) *Required.* — Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the n th term and the sum of the terms of arithmetic and geometric progressions, with applications.

Plane Geometry: The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(b) *Elective.* — Solid Geometry: The usual theorems and constructions of good textbooks, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

Plane Trigonometry: A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

PHYSICS. — To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work must consist of both classroom work and laboratory practice. The work covered in the class-room should be equal to that outlined in Hall & Bergen's "Textbook of Physics" or Millikan & Gale; the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory note-book. This note-book, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination submitted. Candidates entering on certificate will not be required to present note-books, but the principal's certification must cover laboratory as well as class-room work.

PHYSIOLOGY. — Hough & Sedgwick's "The Human Mechanism;" Martin's "The Human Body; Briefer Course."

ZOOLOGY, PHYSICAL GEOGRAPHY, GEOLOGY. — The following suggestions are made concerning preparation for admission in the subjects named above: —

For physiography, Davis' "Elementary Physical Geography;" Gilbert & Brigham's "Introduction to Physical Geography." For zoölogy, textbooks entitled "Animals" or "Animal Studies," by Jordan, Kellogg and Heath; Linville & Kelley's "A Textbook in General Zoölogy." For geology, A. P. Brigham's "A Textbook of Geology" or Tarr's "Elementary Geology."

Applicants for examination in zoölogy are *required* to present certified laboratory note-books; applicants for examination in the other subjects are *advised* to present note-books, if laboratory work has been done. Good note-books may be given credit for entrance. Examination in these subjects will be general, in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

HISTORY. — The required unit must be offered in either ancient history, medieval and modern history, English history, general history, or United States history and civics. Either one, two or three elective units in any of the historical subjects here named may be offered, provided that no unit be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good textbooks, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on outline maps.

To indicate in a general way the character of the textbook work expected, the texts of the following authors are suggested: Botsford, Morey or Myers, in ancient history (to 814 A.D.); Adams, West or Myers, in medieval history; Montgomery, Larned or Cheyney, in English history; Myers or Fisher, in general history; Fiske, together with MacLaughlin or Montgomery, in United States history and civics.

ENGLISH. — The study of English in school has two main objects, which should be considered of equal importance: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence and appreciation, and the development of the habit of reading good literature with enjoyment.

(1) *Grammar and Composition* (One and One-half Units). — The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, sentences and paragraphs should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise letter-writing, narration, description and easy exposition and argument. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by con-

certed effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

(2) *Literature* (One and One-half Units). — The second object is sought by means of two lists of books, headed, respectively, "Reading" and "Study," from which may be framed a progressive course in literature covering four years. In connection with both lists the student should be trained in reading aloud and encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. *Books for Reading*. — The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

The books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except that for any book in Group I a book from any other may be substituted.

Group I. Classics in Translation.

The "Old Testament," at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther.

The "Odyssey," with the omission, if desired, of Books I-V, XV and XVI.

The "Æneid."

The "Odyssey" and the "Æneid" should be read in English translations of recognized literary excellence.

Group II. Drama.

Shakespeare: "Merchant of Venice," "As You Like It," "Julius Cæsar."

Group III. Prose Fiction.

Dickens: "A Tale of Two Cities."

George Eliot: "Silas Marner."

Scott: "Quentin Durward."

Hawthorne: "The House of the Seven Gables."

Group IV. Essays, Biography, etc.

Addison and Steele: "The Sir Roger de Coverley Papers."

Irving: "The Sketch Book," selections covering about 175 pages.

Macaulay: "Lord Clive."

Parkman: "The Oregon Trail."

Group V. Poetry.

Tennyson: "The Coming of Arthur," "Gareth and Lynette," "Lancelot and Elaine," "The Passing of Arthur."

Browning: "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "Herve Riel," "Pheidippides," "My Last Duchess," "Up at a Villa — Down in the City," "The Italian in England," "The Patriot," "The Pied Piper," "De Gustibus," "Instans Tyrannus."

Scott: "The Lady of the Lake."

Coleridge: "The Ancient Mariner."

Arnold: "Sohrab and Rustum."

B. Books for Study. — This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions.

The books provided for study are arranged in four groups, from each of which one selection is to be made.

Group I. Drama.

Shakespeare: "Macbeth," "Hamlet."

Group II. Poetry.

Milton: "L'Allegro," "Il Penseroso," "Comus."

Book IV of Palgrave's "Golden Treasury" (first series), with special attention to Wordsworth, Keats and Shelley.

Group III. Oratory.

Burke: "Speech on Conciliation with America."

Washington's "Farewell Address," Webster's "First Bunker Hill Oration," and Lincoln's "Gettysburg Address."

Group IV. Essays.

Macaulay: "Life of Johnson."

Carlyle: "Essay on Burns," with a brief selection from Burns' poems.

Examination. — However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies and from his personal knowledge and experience quite apart from reading.

The examination in literature will include: —

(a) General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under "A, Reading," above.

(b) A test on the books prescribed for study, which will consist of questions upon their content and structure, and upon the meaning of such words, phrases and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their works and the periods of literary history to which they belong.

FRENCH. — Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission). — For a third credit unit in French as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in French will be given unless the candidate has presented elementary French on certificate, or has written the examination in elementary French.

No examination for a fourth credit in French will be given unless the candidate has presented both elementary and intermediate French upon certificate, or has written the examination in both elementary and intermediate French.

GERMAN. — *Elementary*: The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).

Third and fourth year German (elective subjects for admission). — For a third credit unit in German as an elective subject for entrance, when required units have been offered in German, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in German will be given unless the candidate has presented elementary German upon certificate, or has written the examination in elementary German.

No examination for a fourth credit in German will be given unless the candidate has presented both elementary and intermediate German upon certificate, or has written the examination for both elementary and intermediate German.

SPANISH. — *Elementary*: The necessary preparation for this examination is stated in the description of the two-year course in elementary Spanish recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year Spanish (elective subjects for admission). — For a third credit unit in Spanish as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in Spanish will be given unless the candidate has presented elementary Spanish on certificate, or has written the examination in elementary Spanish.

No examination for a fourth credit in Spanish will be given unless the candidate has presented both elementary and intermediate Spanish upon certificate, or has written the examination in both elementary and intermediate Spanish.

GREEK. — *Elementary*. — Greek grammar and composition: Translation into Greek of short sentences illustrating common principles of syntax.

The examination in grammar and prose composition will be based on the first four books of Xenophon's "Anabasis."

Intermediate. — Homer's "Iliad," Books I and II (omitting Book II, 494 to end), and the Homeric forms, constructions, idioms and prosody.

Prose composition, consisting of continuous prose based on Xenophon, and other Attic prose of similar difficulty.

Translation of passages of Homer at sight.

The examinations in Greek, elementary and intermediate, will be given in September only.

LATIN. — *Elementary*. — Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from Caesar's "Gallic War," covering at least four books, and (b) the translation of passages of Latin prose at sight.

Intermediate. — Cicero (third oration "Against Catiline" and the orations "For Archias" and "For Marcellus") and sight translation of prose.

Advanced. — Vergil (*Æneid*, II, III and VI) and sight translation of poetry.

E. ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this requirement, a student transferring to this college from another college or university of recognized standing must present the following credentials: —

1. A letter of honorable dismissal from the institution with which he has been connected.

2. A statement or certificate of his entrance record.
3. A statement from the proper officer showing a complete record of his work while in attendance.
4. A marked catalogue showing the courses pursued.
5. A statement from the proper officer, giving the total number of credits required for graduation by the institution from which the applicant is transferring, and, of this total, the number that the applicant has satisfactorily completed at the time of transfer.

These credentials should be presented to the registrar. Applications will be judged wholly on their merits and the college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

F. OTHER INFORMATION ABOUT ENTRANCE.

1. The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable. (It is immaterial whether the pupil has entered by certificate or by examination.)
2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 65 per cent.
3. To matriculate, candidates must offer twelve and one-half of the fourteen and one-half units required for admission, and will be conditioned in those subjects not passed. At least five and one-half credits must be in the prescribed group. No candidate deficient in both algebra and plane geometry will be admitted.
4. Examinations for the removal of entrance conditions will be held during the first week of the second term.
5. Credits for entrance requirements, whether gained by certificate or by examination, will hold good for one year.
6. Examinations in part of the subjects required for entrance may be taken one year before entering college.
7. For information concerning expenses, scholarships, etc., see "General Information."
8. For information concerning admission to short courses, see "Short Courses."
9. Application for admission as a "Special Student" should be made to the Dean.

COURSES OF INSTRUCTION.

FRESHMAN YEAR.

TABLE OF FRESHMAN SUBJECTS.

[The figures indicate the number of credit hours per week. Freshman credit is computed on the basis of total clock hours per week spent in class room and study. Groups A and B of each term are required of all Freshman men; groups A and C of all Freshman women. For details, see the following tables of the first, second, and third terms, and the description of the courses.]

First Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Study Hours.	Credit in Clock Hours per Week.
<i>Required Groups.</i>				
Group A; for men and women:				
Agriculture 1	1	2	2	5
Chemistry 1	3	4	5	12
or				
Chemistry 4	2	4	4	10
English 1	3	-	5	8
Language 1 or 4 (French or German)	3	-	6	9
Mathematics 1 (Algebra)	4	-	6	10
Group B; for men:				
Military 1 (or Physical Education 7)	-	3	2	5
Physical Education 1	1	-	-	1
Physical Education 2	-	2	-	2
Group C; for women:				
Rural Home Life 1	2	-	-	2
Physical Education 4	-	3	-	3

Second Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Study Hours.	Credit in Clock Hours per Week.
<i>Required Groups.</i>				
Group A; for men and women:				
Agriculture 2	1	2	2	5
Chemistry 2	3	4	5	12
or				
Chemistry 5	2	4	3	9
English 2	3	-	5	8
Language 2 or 5 (French or German)	3	-	5	8
Mathematics 2 (Higher Algebra)	3	-	4	7
or				
Mathematics 3 (Solid Geometry)	3	-	4	7
Mathematics 4 (Mensuration)	2	-	3	5
Group B; for men:				
Military 2 (or Physical Education 8)	-	3	2	5
Group C; for women:				
Physical Education 5	-	3	-	3

Third Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Study Hours.	Credit in Clock Hours per Week.
<i>Required Groups.</i>				
Group A; for men and women:				
Agriculture 3	1	2	2	5
Botany 3	2	4	4	10
English 3	3	-	6	9
Language 3 or 6 (French or German)	3	-	6	9
Mathematics 5 (Trig.)	3	-	6	9
Group B; for men:				
Military 3 (or Physical Education 9)	-	3	2	5
Physical Education 3	-	2	-	2
Group C; for women:				
Physical Education 6	-	3	-	3

SOPHOMORE YEAR.

TABLE OF SOPHOMORE SUBJECTS.

[The figures indicate the number of credit hours per week. Sophomore credit is computed on the basis of total clock hours per week spent in class room and study. Groups A and B of each term are required of all Sophomore men; groups A and C, of all Sophomore women. In addition, one of the "Divisional Elective Groups" is to be elected as a unit by each Sophomore. For details, see the following tables of the first, second, and third terms, and the description of the courses.]

First Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Study Hours.	Credit in Clock Hours per Week.
<i>Required Groups.</i>				
Group A; for men and women:				
Botany 25	1	4	2	7
English 25	2	-	4	6
English 28	1	-	2	3
Physics 25	3	2	4	9
Group B; for men:				
Military 25 (or Physical Education 30)	-	3	2	5
Physical Education 25	-	2	-	2
Group C; for women:				
Rural Home Life 25	1	4	-	5
Physical Education 27	-	3	-	3
<i>Divisional Elective Groups.</i>				
Agriculture:				
Animal Husbandry 25	2	2	3	7
Agronomy 25	2	4	3	9
Horticulture:				
Chemistry 25	1	4	4	9
Drawing 25	-	8	-	8
Science:				
Modern Language (French or German)	3	-	5	8
Chemistry 25	1	4	4	9
Rural Social Science:				
Animal Husbandry 29	2	2	3	7
Economics 25	3	-	6	9

Second Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Study Hours.	Credit in Clock Hours per Week.
<i>Required Groups.</i>				
Group A; for men and women:				
English 26	2	—	4	
English 29	1	—	2	
Zoölogy 26	2	4	3	
Group B; for men:				
Military 26 (or Physical Education 31)	—	3	2	
Group C; for women:				
Agriculture 26	2	—	1	3
Physical Education 28	—	3	—	3
<i>Divisional Elective Groups.</i>				
Agriculture:				
Animal Husbandry 26	2	2	3	7
Chemistry 30	3	4	3	10
Physics 26	3	2	4	9
Horticulture:				
Physics 26	3	2	4	9
Drawing 26	—	6	—	6
Agricultural Economics 26	4	2	6	12
Science:				
Modern Language (French or German)	3	—	5	8
Physics 26	3	2	4	9
Chemistry 26	1	4	4	9
Rural Social Science:				
Agricultural Economics 26	4	2	6	12
Agricultural Education 29	3	—	3	6
American Government 25	3	—	5	8
Landscape Gardening:				
Physics 26	3	2	4	9
Mathematics 26	3	—	6	9
Drawing 26	—	6	—	6

Third Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Study Hours.	Credit in Clock Hours per Week.
<i>Required Groups.</i>				
Group A; for men and women:				
English 27	2	-	4	6
Group B; for men:				
Military 27 (or Physical Education 32)	-	3	2	5
Physical Education 26	-	2	-	2
Group C; for women:				
Rural Home Life 27	1	4	-	5
Physical Education 29	-	3	-	3
<i>Divisional Elective Groups.</i>				
Agriculture:				
Agronomy 27	4	2	3	9
Microbiology 30	-	6	-	6
Rural Engineering 27	-	4	-	4
Rural Engineering 30	-	8	-	8
or				
Physics 27	3	2	4	9
English 30	1	-	2	3
Citizenship 27	2	-	4	6
Horticulture:				
Agronomy 27	4	2	3	9
Entomology 28	2	6	1	9
Physics 27	3	2	4	9
English 30	1	-	2	3
Citizenship 27	2	-	4	6
Science:				
Modern Language (French or German)	3	-	6	9
Physics 27	3	2	4	9
Entomology 26	5	-	4	9
or				
Entomology 28	2	6	1	9
Botany 26	1	6	2	9
Rural Social Science:				
Rural Sociology 27	3	-	6	9
Agronomy 27	4	2	3	9
Entomology 26	5	-	4	9
English 30	1	-	2	3
Citizenship 27	2	-	4	6
Landscape Gardening:				
Mathematics 27	-	6	4	10
Drawing 27	-	8	-	8
Entomology 28	2	6	1	9
English 30	1	-	2	3
Citizenship 27	2	-	4	6

MAJORS: JUNIOR AND SENIOR YEARS.

GENERAL STATEMENT.

A major consists of 150 credit hours of correlated work, which is arranged by the student and his adviser.

The list of courses found under each major on subsequent pages should not be considered as necessarily a rigid program to be followed. The heads of departments have suggested this series of courses as the best for the average man majoring in their departments. Advisers may, however, make modifications to suit the particular needs of the student, provided these modifications conform precisely to the class schedule as published for the year.

RULES GOVERNING MAJORS.

RULE 1. *Election.* — Each student, before the first term of his junior year, shall elect a major subject from the list of majors given below; and this major shall consist of 150 credit hours of correlated work.

RULE 2. *Minimum Credits.* — The minimum number of credits for graduation shall be 288 junior-senior credit-hours in addition to the satisfactory completion of the required courses of the freshman year and of the required and elective groups of the sophomore year.

RULE 3. *Maximum Credits.* — The maximum number of credits for any term of the junior or senior year shall be 54; the minimum shall be 45.

RULE 4. *Humanities and Rural Social Science.* — A minimum of 54 credit hours in the Divisions of the Humanities and Rural Social Science will be required of all students during their junior and senior years, with the following restriction: that a minimum of 12 credit hours will be required in each of the divisions.

RULE 5. *Advisers.* — The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student elects his major. The adviser has full authority to prescribe the student's work up to 150 hours. He will, however, so far as practicable, recognize the individual needs of the student. It is also expected that students will seek the counsel of the adviser with respect to the remaining courses required for graduation.

RULE 6. *Free Electives.* — Each student during his junior and senior years is required to take 150 hours in his major and also 54 hours in the Divisions of the Humanities and Rural Social Science, making a total of 204 hours (but see Rule 4). He is allowed free choice of courses to complete his required hours.

RULE 7. *Registration.* — No junior or senior shall register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the Schedule Room five weeks before the close of each term.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the succeeding term and countersign the card.

(3) Each course card must be filled out, giving the name of student, his major, his class and the name and address of parent or guardian. When the major courses have been entered on this card, and the hours of free elections added by the student, the card, accompanied by one hour plan, must be returned to the Schedule Room two weeks before the beginning of the final examination period.

RULE 8. *Change of Major.* — Applications for change of major may be made to the dean in writing at any time; when approved by both major advisers concerned and by the dean and the committee on scholarship, they become operative at the beginning of the term following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

AGRONOMY. (Major.)

Professor ARTHUR B. BEAUMONT, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agronomy	50 I.	10	I.	Agronomy 50	10	Agronomy 75	10
Agronomy	51 III.	7		Animal Husbandry 50	7	Farm Management 76	8
Agronomy	75 I.	10		Chemistry 51	12		
Agronomy	77 II.	10					
Agronomy	78 II.	7	II.	Chemistry 52	12	Agronomy 77	10
Animal Husbandry	50 I.	7				Agronomy 78	7
Chemistry	51 I.	12					
Chemistry	52 II.	12					
Farm Management	76 I.	8	III.	Agronomy 51	7	Farm Management 77	7
Farm Management	77 III.	7					
		90					

ANIMAL HUSBANDRY. (Major.)

Professor ———, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agronomy	50 I.	10	I.	Agronomy 50	10	Animal Husbandry 75	7
Agronomy ¹	51 III.	7		Animal Husbandry 50	7	Farm Management 76	8
Agronomy ¹	77 II.	10		Dairy 50	10	Rural Engineering 75 ¹	10
Animal Husbandry	50 I.	7				Veterinary 75 or 78	8
Animal Husbandry	51 II.	7	II.	Animal Husbandry 51	7	Agronomy 77 ¹	10
Animal Husbandry	52 III.	7		Farm Management 51	7	Animal Husbandry 76	7
Animal Husbandry	53 III.	10		Veterinary 50	8	Animal Husbandry 81	2
Animal Husbandry	75 I.	7				Rural Engineering 78 ¹	10
Animal Husbandry	76 II.	7	III.			Veterinary 76 or 79	8
Animal Husbandry	77 III.	7		Agronomy 51 ¹	7	Animal Husbandry 77	7
Animal Husbandry	81 II.	2		Animal Husbandry 52	7	Animal Husbandry 82	2
Animal Husbandry	82 III.	2		Animal Husbandry 53	10	Farm Management 81 ¹	6
Dairying	50 I.	10		Dairying 52 ¹	10	Poultry 78 ¹	10
Dairying ¹	52 III.	10				Veterinary 77 or 80	8
Farm Management	51 II.	7					
Farm Management	76 I.	8					
Farm Management ¹	81 III.	6					
Poultry ¹	78 III.	10					
Rural Engineering ¹	75 I.	10					
Rural Engineering ¹	78 II.	10					
Veterinary	50 II.	8					
Veterinary	75 I.						
or Veterinary	78 I.	8					
Veterinary	76 II.						
or Veterinary	79 II.	8					
Veterinary	77 III.						
or Veterinary	80 III.	8					
		178 ²					

¹ Suggested, but not required.² Only 115 credit-hours required.

DAIRYING. (Major.)

Professor HENRY F. JUDKINS, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics . . .	53 III.	12	I.	Agricultural Education 51 ¹	10	Agricultural Economics 83 ¹	6
Agricultural Economics ¹ . . .	75 II.	12		Animal Husbandry 50 . . .	7	Chemistry 61 . . .	12
Agricultural Economics ¹ . . .	76 II.	12		Chemistry 25 . . .	9	Dairying 75 . . .	5
Agricultural Economics ¹ . . .	83 I.	6		Dairying 50 . . .	10	Dairying 76 . . .	9
Agricultural Economics ¹ . . .	84 III.	6				Microbiology 82 . . .	10
Agricultural Education . . .	51 I.	10	II.				
Animal Husbandry . . .	50 I.	7		Dairying 51 . . .	4	Agricultural Economics 75 ¹	12
Animal Husbandry . . .	81 II.	2		Economic Sociology 51 ¹ . . .	12	Agricultural Economics 76	12
Animal Husbandry . . .	82 III.	2		Microbiology 51 . . .	10	Animal Husbandry 81 . . .	2
Chemistry . . .	25 I.	9		Rural Sociology 51 ¹ . . .	9	Dairying 77 . . .	10
Chemistry . . .	61 I.	12	III.	Veterinary Science 50 ¹ . . .	8	Farm Management 51 ¹ . . .	7
Chemistry . . .	63 III.	12					
Dairying . . .	50 I.	10		Dairying 52 . . .	10	Agricultural Economics 53	12
Dairying . . .	51 II.	4		Economic Sociology 52 ¹ . . .	12	Agricultural Economics 84 ¹	6
Dairying . . .	52 III.	10		Rural Engineering 81 ¹ . . .	4	Animal Husbandry 82 . . .	2
Dairying . . .	75 I.	5				Chemistry 63 . . .	12
Dairying . . .	76 I.	9				Dairying 78 . . .	10
Dairying . . .	77 II.	10					
Dairying . . .	78 III.	10					
Economic Sociology ¹ . . .	51 II.	12					
Economic Sociology ¹ . . .	52 III.	12					
Farm Management ¹ . . .	51 II.	7					
Microbiology . . .	51 II.	10					
Microbiology . . .	82 I.	10					
Rural Engineering ¹ . . .	81 III.	4					
Rural Sociology ¹ . . .	51 II.	9					
Veterinary Science ¹ . . .	50 II.	8					
		232 ²					

¹ Suggested, but not required.² Only 146 credit-hours required.

FARM MANAGEMENT. (Major.)

Professor JAMES A. FOORD, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agronomy . . .	50 I.	10	I.	Agronomy 50 . . .	10	Animal Husbandry 75 ¹	7
Agronomy ¹ . . .	51 III.	7		Animal Husbandry 50 . . .	7	Farm Management 76 . . .	8
Agronomy . . .	77 II.	10		Dairying 50 . . .	10	Rural Engineering 75 . . .	10
Animal Husbandry . . .	50 I.	7		Pomology 50 . . .	7	Veterinary 75 . . .	8
Animal Husbandry . . .	51 II.	7					
Animal Husbandry ¹ . . .	52 III.	7	II.	Animal Husbandry 51 . . .	7	Agronomy 77 . . .	10
Animal Husbandry . . .	53 III.	10		Farm Management 51 . . .	7	Animal Husbandry 76 ¹	7
Animal Husbandry ¹ . . .	75 I.	7		Pomology 51 . . .	7	Farm Management 78 . . .	2
Animal Husbandry ¹ . . .	76 II.	7				Rural Engineering 78 . . .	10
Animal Husbandry . . .	77 III.	7					
Dairying . . .	50 I.	10	III.	Agronomy 51 ¹ . . .	7	Animal Husbandry 77 . . .	7
Dairying ¹ . . .	52 III.	10		Animal Husbandry 52 ¹ . . .	7	Farm Management 77 . . .	7
Farm Management . . .	51 II.	7		Animal Husbandry 53 . . .	10	Farm Management 79 . . .	2
Farm Management . . .	76 I.	8		Dairying 52 ¹ . . .	10	Farm Management 81 ¹	6
Farm Management . . .	77 III.	7		Forestry 58 . . .	8	Pomology 78 ¹ . . .	8
Farm Management . . .	78 II.	2				Poultry 78 ¹ . . .	10
Farm Management . . .	79 III.	2				Rural Engineering 79 . . .	10
Farm Management ¹ . . .	81 III.	6					
Forestry . . .	58 III.	8					
Pomology . . .	50 I.	7					
Pomology . . .	51 II.	7					
Pomology ¹ . . .	78 III.	8					
Poultry ¹ . . .	78 III.	10					
Rural Engineering . . .	75 I.	10					
Rural Engineering . . .	78 II.	10					
Rural Engineering . . .	79 III.	10					
Veterinary . . .	75 I.	8					
		209 ²					

¹ Suggested, but not required.² Only 147 credit-hours required.

POULTRY HUSBANDRY. (Major.)

Professor JOHN C. GRAHAM, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics . . .	53 III.	12	I.	Agronomy 50	10	Poultry 75	6
Agronomy	50 I.	10		Animal Husbandry 50	7	Poultry 76	8
Animal Husbandry	50 I.	7		Poultry 50	10	Veterinary 85	8
Farm Management	51 II.	7	II.	Poultry 51	10	Farm Management 51	7
Poultry Husbandry	50 I.	10				Poultry 77	10
Poultry Husbandry	51 II.	10				Veterinary 86	8
Poultry Husbandry	52 III.	10	III.	Agricultural Economics 53	12	Poultry 79	8
Poultry Husbandry	75 I.	6		Poultry 52	10	Veterinary 87	8
Poultry Husbandry	76 I.	8					
Poultry Husbandry	77 II.	10					
Poultry Husbandry	79 III.	8					
Veterinary Science	85 I.	8					
Veterinary Science	86 II.	8					
Veterinary Science	87 III.	8					
		122					

STRONGLY ADVISED. — Microbiology 50 I, Zoölogy 76 II.

FLORICULTURE.

Professor CLARK L. THAYER, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Botany	50 I.	6	I.	Botany 50	6	Floriculture 75	7
Botany	51 II.	6		Floriculture 50	9	Horticulture 50	10
Floriculture	50 I.	9		Floriculture 53	8		
Floriculture	51 II.	9	II.	Botany 51	6	Floriculture 76	7
Floriculture	52 III.	9		Floriculture 51	9	Floriculture 79	8
Floriculture	53 I.	8					
Floriculture	55 III.	7	III.	Floriculture 52	9	Floriculture 77	7
Floriculture	75 I.	7		Floriculture 55	7	Floriculture 80	5-9
Floriculture	76 II.	7				Horticulture 51	10
Floriculture	77 III.	7					
Floriculture	79 II.	8					
Floriculture	80 III.	5-9					
Horticulture	50 I.	10					
Horticulture	51 III.	10					
		108-112					

ADVISED. — The department advises all students who major in this subject to take Entomology 50, Landscape Gardening 75, Botany 78, 79 and 80, and Agricultural Economics 53 and 83.

LANDSCAPE GARDENING. (Major.)

Professor FRANK A. WAUGH, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Floriculture . . .	55 III.	7	I.	Horticulture 50 . . .	10	Landscape Gardening 75 . .	6
Horticulture . . .	50 I.	10		Landscape Gardening 50 . .	10	Landscape Gardening 76 . .	10
Horticulture . . .	51 III.	10		Landscape Gardening 78 . .		Landscape Gardening 78 . .	
Landscape Gardening . .	50 I.	10		or 79	9	or 79	9
Landscape Gardening . .	51 II.	11	II.	Landscape Gardening 51 . .	11	Landscape Gardening 80 . .	12
Landscape Gardening . .	52 III.	12				Landscape Gardening 81 . .	12
Landscape Gardening . .	75 I.	6					
Landscape Gardening . .	76 I.	10					
Landscape Gardening . .	77 III.	12	III.	Floriculture 55 . . .	7	Landscape Gardening 77 . .	12
Landscape Gardening . .	78 I.	9		Horticulture 51 . . .	10	Landscape Gardening 82 . .	12
or				Landscape Gardening 52 . .	12		
Landscape Gardening . .	79 I.	9					
Landscape Gardening . .	80 II.	12					
Landscape Gardening . .	81 II.	12					
Landscape Gardening . .	82 III.	12					
		133					

ADDITIONAL INFORMATION. — Modifications may be permitted when they appear advisable.

POMOLOGY. (Major.)

Professor FRED C. SEARS, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics . .	53 III.	12	I.	Botany 50	6-10	Horticultural Manuf. 75 . .	12
Agromony	77 II.	10		Pomology 50	7	Pomology 75	8
Botany	50 I.	6-10				Pomology 77	8
Horticultural Manufactures . .	75 I.	12				Pomology 80	2
Horticultural Manufactures . .	76 II.	8	II.	Pomology 51	7	Agromony 77	10
Pomology	50 I.	7		Pomology 54	8	Horticultural Manuf. 76 . .	8
Pomology	51 II.	7				Pomology 76	7
Pomology	52 III.	7				Pomology 81	2
Pomology	54 II.	8	III.	Agricultural Economics 53 . .	12	Pomology 78	8
Pomology	75 I.	8		Pomology 52	7	Pomology 82	2
Pomology	76 II.	7				Rural Engineering 78 . .	10
Pomology	77 I.	8					
Pomology	78 III.	8					
Pomology	80 I.	2					
Pomology	81 II.	2					
Pomology	82 III.	2					
Rural Engineering	78 III.	10					
		124-128					

VEGETABLE GARDENING. (Major.)

Professor FRANK A. WAUGH, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agronomy	75 I.	10	I.	Agronomy 75	10	Vegetable Gardening 75 . .	10
Agronomy	77 II.	10		Botany 50	6		
Botany	50 I.	6	II.	Agronomy 77	10	Vegetable Gardening 76 . .	10
Botany	51 II.	6		Botany 51	6		
Vegetable Gardening	52 II.	10		Vegetable Gardening 52 . .	10		
Vegetable Gardening	53 III.	10					
Vegetable Gardening	75 I.	10	III.	Vegetable Gardening 53 . .	10	Vegetable Gardening 77 . .	10
Vegetable Gardening	76 II.	10					
Vegetable Gardening	77 III.	10					
		82					

ECONOMIC BOTANY. (Major.)

Professor A. VINCENT OSMUN, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agricultural Education	56 III.	10	I.	Agronomy 50	10	Botany 58 or 61	8
Agronomy	50 I.	10		Botany 52 or	7	Botany 75 or	11
Botany	52 I.	7		Botany 58 or 61	8	Botany 78	10
Botany	53 II.	7		Chemistry 51	12	Chemistry 80	10
Botany	54 III.	7		English 65	9		
Botany	55 III.	10		French or German 50 . . .	9		
Botany	58 I.	8	II.				
or							
Botany	61 I.	8		Botany 53 or	7	Botany 59 or 62	8
Botany	59 II.	8		Botany 59 or 62	8	Botany 76 or	11
or				Chemistry 52	12	Botany 79	6 or 10
Botany	62 II.	8		Entomology 51	6	Chemistry 86	9
Botany	60 III.	8		French or German 51 . . .	9	Entomology 90	7
or			III.				
Botany	63 III.	8		Agricultural Education 56 .	10	Botany 60 or 63	8
Botany	75 I.	11		or		Botany 77 or	11
Botany	76 II.	11		English 52	9	Botany 80	6 or 10
Botany	77 III.	11		Botany 54 or	7	Agricultural Education 56 .	10
Botany	78 I.	10		Botany 60 or 63	8		
Botany	79 II.	6 or 10		Botany 55	10		
Botany	80 III.	6 or 10		French or German 52 . . .	9		
Chemistry	51 I.	12		Geology 52	10		
Chemistry	52 II.	12					
Chemistry	80 I.	10					
Chemistry	86 II.	9					
English	52 III.	9					
English	65 I.	9					
Entomology	51 II.	6					
Entomology	90 II.	7					
French or German	50 I.	9					
French or German	51 II.	9					
French or German	52 III.	9					
Geology	52 III.	10					
		265-273 ¹					

¹ A student is required to select, in consultation with his major adviser, at least 150 credits from this list.

AGRICULTURAL CHEMISTRY. (Major.)

Professor CHARLES A. PETERS, *Adviser*.

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.	
Chemistry	51 I.	12	I.	Chemistry 51	12	Chemistry 75	12	
Chemistry	52 II.	12		Chemistry 61	12	Chemistry 80	10	
Chemistry	53 III.	12	II.	Chemistry 52	12	Chemistry 86	9	
Chemistry	61 I.	12		Chemistry 62	12	Chemistry 90, 92, 94	12	
Chemistry	62 II.	12	III.	Chemistry 53	12	Chemistry 87	9	
Chemistry	63 III.	12		Chemistry 63	12	Chemistry 91, 93, 95	12	
Chemistry	75 I.	12						
Chemistry	80 I.	10						
Chemistry	86 II.	9						
Chemistry	87 III.	9						
Chemistry	90 II.	12						
Chemistry	92 II.							
Chemistry	94 II.	12 ¹						
Chemistry	91 III.							
Chemistry	93 III.							
Chemistry	95 III.							
		136						

A knowledge of German is required. Students having had no German previously should elect it at the beginning of the sophomore year.

¹ Students will select one course from groups 90, 92, 94, and 91, 93, 95, respectively.

ECONOMIC ENTOMOLOGY. (Major.)

Professor HENRY T. FERNALD, *Adviser*.

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Botany	51 II.	8	I.	Chemistry 51 ¹	12	Chemistry 80	10
Chemistry	80 I.	10		Entomology 52	8	Entomology 76	11
Entomology	52 I.	8		Entomology 53	12	Entomology 85	7
Entomology	53 I.	12		Entomology 54	4	Horticulture 50 ¹	10
Entomology	54 I.	4		French or German 50 ¹	9	Zoology 50	7
Entomology	55 II.	8	II.	Botany 51	8	Entomology 77	12
Entomology	56 II.	6		Chemistry 52 ¹	12	Entomology 90	7
Entomology	65 III.	8		Entomology 55	8	Pomology 79 ¹	7
Entomology	75 III.	8		Entomology 56	6	Zoology 51	7
Entomology	76 I.	11		French or German 51 ¹	9		
Entomology	77 II.	12	III.	Entomology 65	8	Entomology 78	9
Entomology	78 III.	9		Entomology 75	8	Geology 52	10
Entomology	85 I.	7		Chemistry 53 ¹	12	Horticulture 51 ¹	10
Entomology	90 II.	7		French or German 52 ¹	9	Pomology 78 ¹	8
Geology	52 III.	10				Zoology 52	7
Zoology	50 I.	7					
Zoology	51 II.	7					
Zoology	52 III.	7					
		149					

¹ Suggested, but not required.

MICROBIOLOGY. (Major.)

Professor CHARLES E. MARSHALL, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Microbiology . . .	50 I.	10	I.	Microbiology 50 . . .	10	Microbiology 60 . . .	9
or Microbiology . . .	50 II.			Microbiology 60 . . .	9	Microbiology 81 . . .	10
or Microbiology . . .	50 III.	10	II.	Microbiology 50 . . .	10	Microbiology 61 . . .	9
Microbiology . . .	51 II.			Microbiology 51 . . .	10	Microbiology 75 . . .	10
or Microbiology . . .	51 III.	10	III.	Microbiology 61 . . .	9	Microbiology 80 . . .	10
Microbiology . . .	52 III.			Microbiology 50 . . .	10	Microbiology 62 . . .	9
Microbiology . . .	60 I.	9		Microbiology 51 . . .	10	Microbiology 76 . . .	10
Microbiology . . .	61 II.	9		Microbiology 52 . . .	10	Microbiology 83 . . .	10
Microbiology . . .	62 III.	9		Microbiology 62 . . .	9		
Microbiology . . .	81 I.	10					
or Microbiology . . .	82 I.						
or Microbiology . . .	83 III.	10					
Microbiology . . .	80 II.						
or Microbiology . . .	75 II.	10					
Microbiology . . .	76 III.	10					
		87					

AGRICULTURAL ECONOMICS. (Major.)

Professor ALEXANDER E. CANCE, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics . . .	50 I.	12	I.	Agricultural Economics 50	12	Agricultural Economics 77	12
Agricultural Economics . . .	52 II.	12		Agricultural Education 55	10	Agricultural Economics 79	12
Agricultural Economics . . .	53 III.	12	II.	English 65	9		
Agricultural Economics . . .	75 II.	12		Agricultural Economics 52	12	Agricultural Economics 75	12
Agricultural Economics . . .	76 II.	12	III.	Economic Sociology 51 . . .	12	Agricultural Economics 76	12
Agricultural Economics . . .	77 I.	12		Rural Sociology 51 ¹ . . .	9		
Agricultural Economics . . .	78 III.	9					
Agricultural Economics . . .	79 I.	12					
Agricultural Economics . . .	87 III.	9		Agricultural Economics 53	12	Agricultural Economics 78	9
Agricultural Education . . .	55 I.	10		Economic Sociology 52 . . .	12	Agricultural Economics 87	9
Economic Sociology . . .	51 II.	12		Rural Sociology 52 ¹ . . .	9		
Economic Sociology . . .	52 III.	12					
English	65 I.	9					
Rural Sociology ¹	51 II.	9					
Rural Sociology ¹	52 III.	9					
		163 ²					

¹ Suggested, but not required.² Only 145 credit-hours required.

AGRICULTURAL EDUCATION. (Major.)

Professor WINTHROP S. WELLES, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

[illegible]

Courses indicated for juniors and seniors are planned for students preparing to teach agriculture.

Advised.—(a) For general teaching program 51, 55, 56, 75 and 80 or their equivalents. (b) For extension teaching 51, 55, 76, 77 and 80 or their equivalents. (c) For special cases consult the department.

RURAL SOCIOLOGY. (Major.)

Professor — —, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics .	50 I.	12	I.	Economics Sociology 50 .	15	Agricultural Economics 50	12
Agricultural Economics .	52 II.	12		Rural Sociology 50 .	9	Economic Sociology 75 .	15
Agricultural Economics .	53 III.	12				Rural Sociology 79 .	3-9
Agricultural Economics .	75 II.	12					
Economics and Sociology	50 I.	15	II.	Economic Sociology 51 .	12	Agricultural Economics 52	12
Economics and Sociology	51 II.	12		Rural Sociology 51 .	9	Agricultural Economics 75	12
Economics and Sociology	52 III.	12				Rural Sociology 77 .	9
Economics and Sociology	75 I.	15				Rural Sociology 80 .	3-9
Rural Sociology .	50 I.	9	III.				
Rural Sociology .	51 II.	9		Economic Sociology 52 .	12	Agricultural Economics 53	12
Rural Sociology .	52 III.	9		Rural Sociology 52 .	9	Rural Sociology 81 .	3-9
Rural Sociology .	77 II.	9					
Rural Sociology .	79 I.	3-9					
Rural Sociology .	80 II.	3-9					
Rural Sociology .	81 III.	3-9					
		147-165 ¹					

¹ Only 150 credit-hours required.

DESCRIPTION OF COURSES.

DIVISION OF AGRICULTURE.

Professor FOORD.

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Agriculture.

1. **I. 2. II. 3. III.** AGRICULTURE. — Required course for all freshmen. A survey course, tracing the development of man as influenced by agriculture. It considers those problems which our complicated, present-day civilization looks to agriculture to solve, — problems practical, scientific, commercial, sociological. The object of the course is to give to students the agricultural concept, and an appreciation of the close relationship of all lines of human activity to the great problems of agriculture.

1 lecture, 2 quiz hours, 2 study hours, credit, 5.
Assistant Professor LANPHEAR.

26. **II.** AGRICULTURAL OPPORTUNITIES FOR WOMEN. — For sophomore women. Designed to show the woman who is interested in agriculture what opportunities there are for her in that field, and how she may best take advantage of them. The types of agricultural work for which women are best adapted are discussed. A study is made of some of the special problems which confront the woman farmer, and her best ways of solving them.

2 class hours, 1 study hour.

Credit, 3.
Miss HAMLIN.

Agronomy.

Professor BEAUMONT, Assistant Professor MICHELS, Assistant Professor LANPHEAR, Mr. THAYER, Mr. JONES.

The courses in agronomy are designed to present the fundamental knowledge concerning the soil and the principal products of the field. The basic course in soils is required of students majoring in the agriculture, horticulture, and rural social science divisions. The electives are designed to meet the needs of those specializing in soils and field crops and other specialized fields including both pure and applied science.

The laboratories for soils and fertilizers include one for elementary work, supplied with locker equipment for 200 students, and one for advanced work, accommodating 80 students. These laboratories are equipped with steam and electric ovens, balances, centrifuge, microscopes and other apparatus necessary for a study of soils and fertilizers. Storerooms, stock rooms, and balance rooms are conveniently near the laboratories. There is also a workroom attached, equipped with power machinery for grinding soils, fodders and the like.

The crops' laboratories include one for seed study, with lockers for 50 students, and a laboratory for the study of cereals, forage crops, roots, etc., with lockers for 64 students. The equipment of these laboratories includes steam ovens, constant temperature electric ovens, ovens for seed germination, Brown-Duval moisture apparatus, balances, microscopes, and collections of seeds, grasses, tubers, weeds, etc. A balance room, root cellar and two storerooms, one of which is mouse-proof, are also used for crop work.

A modern steam-heated greenhouse 25 by 35 feet, used for work in soils and crops, is a valuable part of the equipment. Near the greenhouse is a crop garden on which different varieties of corn, grasses, clovers, etc., are grown for demonstration purposes, and as a source of material for class work. In addition, the general college farm of 250 acres is used for field study in soils and crops, and as a source of material.

Required Courses.

25. **I. AGRONOMY.** — For sophomores. An introductory course designed to acquaint the student with the most important field crops and their production. 2 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 9.
Assistant Professor MICHELS and the DEPARTMENT.

27. **III. SOILS AND FERTILIZERS.** — For sophomores. A study of soils and their properties, soil management, methods of soil improvement and maintenance of fertility, including the use of farm manures, commercial fertilizers and soil amendments. 4 class hours. 1 2-hour laboratory period, 3 study hours, credit, 9.
Professor BEAUMONT and the DEPARTMENT.

Prerequisite, Freshman-required Chemistry.

Elective Courses.

50. **I. FIELD AND FORAGE CROPS.** — For juniors; seniors may elect. History, classification and production of corn and of those grasses, legumes, root and tuber crops suited to New England conditions. Crops of less importance in New England are briefly considered. The work includes lecture, laboratory and field study. 3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.
Assistant Professor MICHELS.

Prerequisites, Agronomy 25 and 27, Botany 3.

51. **III. ADVANCED FIELD CROPS (1924-25).** — For juniors; seniors may elect. Study of the cereals and other field crops not taken up or only briefly considered in Course 50. General problems of crop production are also considered, and the work is not entirely confined to New England conditions. The laboratory work includes a study of the cereals, the quality of seeds, grains and crop products, crop problems and field work with such crops as are available. Given in alternate years. 2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Assistant Professor MICHELS.

Prerequisite, Agronomy 50.

75. **I. ADVANCED SOILS.** — For seniors; juniors may elect. A continuation of studies begun in Agronomy 27 with special emphasis placed on soil classification and adaptability and recent advances in soil science. The field work consists of a detailed study of soil texture and other properties affecting crop adaptability and soil management; accompanied by a laboratory study of the physical properties of the soils sampled. 2 class hours. 2 study hours, 1 4-hour and 1 2-hour laboratory period, credit, 10.
Professor BEAUMONT.

Prerequisite, Agronomy 27.

77. **II. MANURES AND FERTILIZERS.** — For seniors. An advanced course, giving a general discussion of the different theories which have been held relative to the functions and importance of manures and fertilizers, and leading up to the views at present accepted. Considerable attention is devoted to consideration of the experimental work which has been done, and which is now in progress. The

laboratory work consists of a study of fertilizers, fertilizer mixtures, limes and culture work.

3 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 10.

Professor BEAUMONT and the DEPARTMENT.

Prerequisite, Agronomy 27. Advised, Chemistry 61.

78. **II. BREEDING OF FIELD CROPS (1924-25).** — For seniors. Deals with the improvement, by selection and breeding, of the crops studied in Course 50. Given in alternate years.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor MICHELS.

Prerequisite, Agronomy 50.

Animal Husbandry.

Professor —, Assistant Professor RICE, Assistant Professor GLATFELTER, Mr. THAYER.

It is the purpose of this department to present comprehensive information on the subject of animal husbandry. The first courses are studies of the breeds, types and market classes of live stock. These are followed by courses in judging, breeding and management.

The department is equipped with an excellent laboratory, Grinnell Arena, which has a seating capacity of 180. The equipment for classroom instruction includes upwards of 125 head of dairy cattle which are superior representatives of Jersey, Guernsey, Ayrshire and Holstein breeds; considerable numbers of Berkshire and Chester White pigs; pure-bred Percherons; and several work teams of various types. The department has a collection of plaster of Paris models of individuals of foreign and domestic breeds of horses, cattle, sheep and swine; and a set of over 250 lantern slides portraying the leading prize-winning producing and breeding animals of the principal breeds of horses, cattle, sheep and swine. There is also a collection of the different foodstuffs available for the use of New England farmers. All this equipment is being added to from time to time as funds are available.

Required Courses.

25. **I. LIVESTOCK JUDGING AND MARKET CLASSES OF FARM ANIMALS.** — A study of the principles governing the selection of animals for market, feed lot, breeding, milk production and work, including the use of the score card and the comparative judging of the various types of live stock. Text book, Vaughn's "Types and Market Classes of Farm Animals."

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Mr. THAYER.

26. **II. TYPES AND BREEDS OF LIVESTOCK.** — A course covering the origin, history, development and characteristics of the different breeds of horses and sheep. Text book, Plumb's "Types and Breeds of Farm Animals."

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Mr. THAYER.

Prerequisite, Animal Husbandry 25.

29. **I. GENERAL ANIMAL HUSBANDRY.** — For students majoring in Rural Social Science. A general course to include work in the types, breeds, feeding, breeding and judging of farm animals.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Mr. THAYER.

Elective Courses.

50. **I. FEEDS AND FEEDING.** — For juniors. A study of the principles of animal nutrition; of the composition and qualities of feeding materials. Text book, Henry's "Feeds and Feeding."

3 class hours, 4 study hours.

Credit, 7.

Assistant Professor RICE.

Prerequisite, Animal Husbandry, 25 and 26.

51. **II. FEEDS AND FEEDING.** — For juniors. A study of feeding practice as related to all farm animals. Considerable work will be given in the formulating of rations.

3 class hours, 4 study hours.

Credit, 7.

Assistant Professor RICE.

Prerequisite, Animal Husbandry 50.

52. **III. ADVANCED STOCK JUDGING.** — For juniors; seniors may elect. Designed to equip students in the judging of classes of different types of live stock; to strengthen them in the selection of superior sires; and equip them for stock judging at fairs. Visits are made to the best herds for the various breeds of stock in the State. Judging teams to represent the college will be selected from this class.

1 2-hour and 1 8-hour laboratory period, credit, 7.

Assistant Professor RICE.

Prerequisites, Animal Husbandry 25 and 26.

53. **III. PRINCIPLES OF BREEDING.** — For juniors; seniors may elect. Designed to familiarize students with the problems that are involved in animal improvement; to acquaint them with the facts which are already established; to scrutinize prevailing theories; and to indicate the lines and methods of further work. Some of the subjects studied are: variations, their causes and heritability; DeVrie's theory of mutations; the inheritance of acquired characters; the pure line; Mendelian law; the making of new types; the determination of sex; applications to human heredity. A few periods at the end of the course are devoted especially to the application of principles in live-stock improvement. Supplementary reading.

5 class hours, 5 study hours.

Credit, 10.

Assistant Professor RICE.

Prerequisites, Animal Husbandry 25, 26, Zoölogy 26.

75. **I. BEEF AND SWINE PRODUCTION.** — A study of the leading breeds of beef cattle and swine, together with the work of some of the most successful breeders. Considerable time will be given also to the production of commercial beef and pork. In this course such live-stock management problems as apply to beef cattle and swine will be included.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor RICE.

Prerequisites, Animal Husbandry 51, 52, and 53.

76. **II. HORSE AND SHEEP PRODUCTION.** — A study of the production of these animals planned in the same manner as that of the previous course.

2 lectures.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor GLATFELTER.

Prerequisites, Animal Husbandry 51, 52 and 53.

77. **III. DAIRY CATTLE AND MILK PRODUCTION.** — A study of the leading breeds of dairy cattle, the most successful breeders and famous breeding animals, advance registry testing and feeding for production, sales methods and advertising.

2 lectures.

1 2-hour laboratory period, 3 study hours, credit, 7.

Mr. THAYER.

Prerequisites, Animal Husbandry 51, 52 and 53.

81. **II. DAIRY AND ANIMAL HUSBANDRY.** — Seminar for seniors majoring in dairying and animal husbandry.

1 class hour, 1 study hour.

Credit, 2.

DEPARTMENTS OF DAIRYING AND ANIMAL HUSBANDRY.

82. **III.** A continuation of Course 81.

1 class hour, 1 study hour.

Credit, 2.

DEPARTMENTS OF DAIRYING AND ANIMAL HUSBANDRY.

Dairying.

Professor JUDKINS, Assistant Professor YAXIS, Mr. PENDLETON, Mr. SMITH.

The dairy manufactures building is new, well lighted and of sanitary construction. It is designed and equipped especially for teaching dairy manufactures. The equipment includes all kinds of machinery that are considered essential to the proper handling of milk and the making of cream, butter, ice cream and soft cheeses.

Course 50 is for students who desire a general idea of dairy work and manufacturing processes. Part of the courses are arranged to give instruction in general dairy work as associated with Massachusetts agriculture; part are arranged to give to a smaller group of students more complete work in dairy manufactures. Those majoring in dairy manufactures should have at least one summer's experience in a commercial plant before graduation.

50. **I. GENERAL DAIRYING.** — For juniors; seniors may elect. A general course, prerequisite to all other dairy courses and for those who wish to take only one course in dairying to get a general knowledge of the subject. The work covers briefly a study of milk, its secretion, composition and various tests applied thereto; proper methods of handling milk and cream; the use of separators; elementary butter making, cheese making and ice cream making.
3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.
Professor JUDKINS.

51. **II. JUDGING DAIRY PRODUCTS.** — For juniors. The judging of milk, cheese, butter and ice cream according to standard methods. A team is chosen from this class to represent the college in the dairy products judging contests held at the Eastern States Exposition and at the National Dairy Show.
2 2-hour laboratory periods, credit, 4.
Professor JUDKINS.

Prerequisite, Dairy 50.

52. **III. MARKET MILK.** — For juniors; seniors may elect. A study of the various phases of the market milk industry, sanitary production; transportation; marketing; handling in the city plant; delivery systems; milk and its relation to the public health; inspection; milk laws; food value and advertising. Some milk plants will be visited.
3 class hours. 1 4-hour laboratory period, 3 study hours, credit, 10.
Professor JUDKINS and Mr. SMITH.

Prerequisite, Dairy 50.

75. **I. MILK PRODUCTS.** — For seniors. The manufacture of milk products other than butter and ice cream, including cheddar cheese, soft and fancy cheese, condensed and powdered milk, casein, commercial buttermilk, etc. Laboratory exercise largely in cheese making and commercial buttermilk manufacture.
1 class hour. 1 4-hour laboratory period, credit, 5.
Assistant Professor YAXIS.

Prerequisite, Dairy 50.

76. **I. ADVANCED TESTING.** — For seniors; juniors may elect. Work covers moisture and fat testing for all dairy products; the casein test; salt test for butter; acid tests; work with the Mojonnier apparatus and many other applied chemical tests used in dairy manufacture work.
2 4-hour laboratory periods, 1 study hour, credit, 9.
Mr. PENDLETON.

Prerequisite, Dairy 50.

Elective Courses.

77. **II. BUTTER MAKING.** — For seniors; juniors may elect. A study of separators and cream separation; handling milk and cream for butter making; preparation of starters, and ripening cream; churning; markets and their requirements; marketing, scoring and judging butter; management; butter making machinery and care thereof; problems.

2 class hours.

2 3-hour laboratory periods, 2 study hours, credit, 10.

Assistant Professor YAXIS.

Prerequisite, Dairying 50.

78. **III. ICE CREAM MAKING.** — For seniors; juniors may elect. A study of the principles and practice of ice cream making. Laboratory equipment is modern and the laboratory instruction will cover commercial practices. Some ice cream plants will be visited.

2 class hours.

2 3-hour laboratory periods, 2 study hours, credit, 10.

Mr. PENDLETON.

Prerequisite, Dairying 50.

Farm Management.

Professor FOORD, Assistant Professor ABELL.

The purpose of the courses in this department is to present various considerations of farming as a business. This involves a knowledge of the cost of production and the profit from the different enterprises such as dairy, poultry or orchard; a study of the enterprises, and the relative amounts of each that will give the best use of labor and equipment on the farm under consideration.

The college farm of 250 acres is under the general supervision of the Department of Farm Management, and furnishes demonstration material. It includes improved land, pasture land and a farm woodlot. The improved land illustrates the value of good culture and the best known methods for the maintenance of fertility. The farm is equipped with suitable buildings and good machinery for the work carried on, of which the production of certified milk is an important branch. Several good farms in the vicinity, illustrating types of both special and general agriculture, may be inspected and studied. The offices of the department are in Stockbridge Hall.

Elective Courses.

51. **II. FARM ACCOUNTS AND COST ACCOUNTING.** — For seniors; juniors may elect. A study of farm inventories, single-enterprise accounts, complete farm accounts and farm records. Special emphasis is given to the interpretation of results and their application in the organization and management of the farm.

1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.

Professor FOORD.

76. **I. FARM MANAGEMENT.** — For seniors; juniors may elect. A study of farming as a business; regions and types of farming; the general principles of farm management and the influence of size, production, live stock and crop farming on the farmer's labor income; arrangement of fields and buildings; use of land, capital and labor; choosing and buying a farm.

2 class hours.

1 2-hour laboratory period, 4 study hours, credit, 8.

Professor FOORD.

Prerequisites, Agronomy 50, Animal Husbandry 25 and 26, and some farm experience.

77. **III. FARM MANAGEMENT.** — For seniors; juniors may elect. A further and more specific study of the principles and practices as outlined in Course 76, with reference to their application to different regions of the United States and

especially to New England. Trips to successful farms are a required part of the course.

1 class hour.

1 4-hour laboratory period, 2 study hours, credit, 7.

Professors FOORD and ABELL.

Prerequisites, Farm Management 51 and 76.

78. **II. SEMINAR.** — For seniors majoring in general agriculture; others by arrangement.

1 class hour.

1 study hour, credit, 2.

Professors FOORD and ABELL.

79. **III. SEMINAR.** — For seniors majoring in general agriculture; others by arrangement.

1 class hour.

1 study hour, credit, 2.

Professors FOORD and ABELL.

81. **III. FARMING IN THE UNITED STATES.** — For seniors. A study of the agricultural regions of the United States and the different types and methods of farming carried on in each. The economic reasons for the establishment and maintenance of each type will be considered.

2 2-hour laboratory periods, 2 study hours, credit, 6.

The DEPARTMENT.

Prerequisite, Farm Management 76.

Poultry Husbandry.

Professor GRAHAM, Professor SANCTUARY,¹ Assistant Professor BANTA, Miss PULLEY.

The introductory courses (50, 51, 52) give a knowledge of the general routine of elementary poultry keeping. The advanced studies prepare men for the successful operation of poultry plants, either as owners or managers. Graduate work, preparation for further teaching, extension or investigation.

The poultry plant consists of 8 acres of land sloping gently to the west. The buildings consist of three incubator cellars equipped with a number of lamp incubators and two mammoth machines with a total capacity of 9,000 eggs; a pipe brooder house (open pipe system) and 40 colony brooder houses which give a brooding capacity for 7,000 chicks, the equipment for these houses including a large variety of coal-stove brooders and kerosene hovers; a long laying house 14 by 180 feet, which accommodates 500 layers, furnishing facilities for student work in pen management, utility and fancy judging, etc.; and a laboratory 14 by 80, for killing, picking, drawing, trussing, packing, crate fattening and cramming. The fattening equipment consists of a modern sanitary all-steel battery with 16 compartments and 10 wooden crates, accommodating, altogether, 350 birds. There are also a storage building, 28 to 64 feet, for root cellar, poultry carpentry, poultry mechanics, feed room and storage; an experimental breeding house, 18 by 60; a combination laying, testing and breeding house, 18 by 72, for experimental purposes; a model laying house, 18 by 30, for 100 hens, and a house 20 by 40, for 200 hens. The six old experiment-station houses, each 12 by 18 feet, are used as special mating and overflow pens. The total capacity for laying hens is 1,600. A manure shed 14 by 18 feet; an oil and tool house 10 by 12; an incinerator 10 by 10; and two backyard model poultry houses 8 by 10 and 8 by 8 give a total of 76 buildings, not including a pheasant run, 16 roosting sheds 10 by 10, and numerous small coops for natural incubation and brooding.

Elective Courses.

50. **I. JUDGING AND CULLING.** — For juniors; seniors may elect. A study of the origin and evolution of our standard breeds and varieties. Judging for production quality, using trap-nested birds; culling the flock; judging exhibition

¹ Absent on leave.

quality by score card and comparison. Several farms will be visited, also several of the leading Connecticut Valley Poultry Shows. Poultry Judging Teams competing in the Intercollegiate Contest at Madison Square Garden are trained in this course.

2 class hours.

2 3-hour laboratory periods, 2 study hours, credit, 10.
Assistant Professor BANTA.

51. **II. POULTRY FEEDS AND FEEDING.** — For juniors; seniors may elect. A study of the principles and practices of poultry nutrition and their relationship to other poultry problems. An important part of the work will be the practical management of a pen of birds for a period of weeks, including observations and detailed record keeping.

3 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 10.
Assistant Professor BANTA.

52. **III. INCUBATION, BROODING AND GROWING.** — For juniors; seniors may elect. A study of the fundamental principles of incubation and rearing chicks; also of modern equipment, including small and mammoth incubators and various types of brooding apparatus.

2 class hours.

3 2-hour laboratory periods, 2 study hours, credit, 10.
Professor SANCTUARY and Miss PULLEY.

75. **I. POULTRY HOUSING AND SANITATION.** — For seniors. A consideration of the biological and economic principles fundamental in the efficient designing, practical construction and equipping poultry farm buildings; also of external parasites and the insecticidal agents for their control.

3 class hours.

3 study hours, credit, 6.
Assistant Professor BANTA.

76. **I. MARKET POULTRY AND POULTRY PRODUCTS.** — For seniors. A study of the market classes of poultry, eggs and feathers, the requirements of different markets, methods of marketing, the cold storage of poultry and eggs. Preserving eggs, judging and scoring of live and dressed market poultry and market eggs are important features. Students are required to fatten pens of chickens by different methods and rations, keeping accurate data of the gains in weight and quality, also the costs of feed and labor, and resultant profit or loss. The annual market poultry show is staged under the direction of members of this class.

2 class hours.

2 2-hour laboratory periods, 2 study hours, credit, 8.
Professor GRAHAM and Miss PULLEY.

77. **II. POULTRY BREEDING.** — For seniors. A study of the principles of breeding and their application to poultry. Practice work in record keeping, pedigree hatching, stud and flock mating will be required as the season permits.

4 class hours.

1 2-hour laboratory period, 4 study hours, credit, 10.
Professor SANCTUARY.

78. **III. FARM POULTRY.** — For seniors; juniors may elect. For those students who desire a general knowledge of poultry husbandry but who cannot devote more than one term to the subject; it is not intended for students specializing in poultry, and such students are admitted only by special permission. Emphasis is placed on the farm flock and its economic management. Utility classification, housing, culling, feeding, hatching, rearing, production, marketing and disease control receive special consideration.

3 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 10.
Assistant Professor BANTA.

79. **III. POULTRY FARM ORGANIZATION.** — For seniors. A study of the organization of the poultry farm for greatest efficiency. The layout of fields and

buildings, crop rotations, records, accounts and advertising will receive consideration. One or more trips will be made to representative successful poultry farms.

3 class hours.

1 2-hour laboratory period, 3 study hours, credit, 8.

Prerequisite, Poultry 77.

Professor GRAHAM.

Rural Engineering.

Professor GUNNESS, Assistant Professor STRAHAN, Mr. PUSHEE, Mr. NEWLON.

The courses in rural engineering are planned to give a working knowledge of those phases of engineering which apply directly to the farm. It is expected that the student will acquire a clear understanding of modern farm practice as it relates to permanent improvements of the farm and the farmstead, and in the selection and use of farm equipment.

This department has an office and the use of a lecture room in Stockbridge Hall. The work on farm structures is given in the large drawing room in the same building. This room is fitted with thirty drawing tables. Models and blue prints are available for the study of farm buildings. A set of post molds and a machine for making cement tile afford opportunity for practical work with cement.

The rural engineering shop is a one-story structure 68 by 126 feet. The carpenter shop in this building is fitted with benches fully equipped with tools for each student. The general repair shop is equipped with forges, benches, a drill press and grinders. The laboratory for farm machinery and farm motors is equipped with a complete line of field machines, gasoline engines, tractors and pumps. A complete assortment of engine accessories, consisting of carburetors, magnetos, etc., is available for thorough instruction in gas engines. A small dynamo and switchboard are used in the study of farm-lighting systems. The work on the small field machines is given in the basement of Stockbridge Hall, and the work on steam engines and steam heating is given in Flint Laboratory.

Required Courses.

27. **III. MECHANICAL DRAWING.** — For sophomores; juniors and seniors may elect. Exercises are given in freehand lettering, geometric construction, orthographic projection and isometric drawing. Practice is given in inking, tracing, and blueprinting.

2 2-hour laboratory periods, credit, 4.
Assistant Professor STRAHAN.

30. **III. SHOP PRACTICE.** — For sophomores; juniors and seniors may elect. Practice is given in the use of carpentry tools by exercises in bench work, repair of farm equipment and farm building construction. Exercises in forge work, pipe fitting, soldering, babbiting and fitting bearings, lining up shafting, lacing belts, and splicing rope. Practice in the use of machinists' tools, such as file, cold chisel, drill press, lathe, taps and dies.

4 2-hour laboratory periods, credit, 8.
Mr. PUSHEE and Mr. NEWLON.

Elective Courses.

75. **I. FARM STRUCTURES.** — For seniors; juniors may elect. A study of the strength and durability of concrete, wood, stone, and clay products, and of the mechanical principles underlying their use in farm construction. The design of various farm buildings, such as the general purpose barn, dairy stable, hog house, sheep barn, milk house, etc. In the drafting room, details of construction will be worked out, a study of the mechanics of simple roof trusses will be made, and a

complete design of some major farm building will be finished in all essential details. If time permits, blueprints of the finished design can be made.

2 class hours. 3 2-hour laboratory periods, 2 study hours, credit, 10.
Assistant Professor STRAHAN.

78. **II and III. FARM MOTORS.** — This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing.
3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.
The DEPARTMENT.

79. **III. DRAINAGE AND IRRIGATION ENGINEERING.** — For seniors; juniors may elect. Covers the engineering phase of drainage and irrigation. The various systems are studied, and practice is given in the design of drainage and irrigation systems. Field work gives practice in surveying for drains, platting, locating drains, erecting batterboards and laying tile. Practice is given in assembling equipment for spray irrigation, and the flow of water through nozzles is studied by means of laboratory tests.
2 class hours. 2 3-hour laboratory periods, 2 study hours, credit, 10.
Assistant Professor STRAHAN.

81. **III. DAIRY MECHANICS.** — A study of dairy machinery, including steam boilers, engines, pumps, traps, refrigeration machinery, and heat-controlling devices. Practice is given in pipe fitting, packing valves, lacing belts, and similar repair jobs on the equipment used in dairy plants.
1 4-hour laboratory period, credit, 4.
Professor GUNNESS and Mr. NEWLON.

DIVISION OF HORTICULTURE.

Professor WAUGH.

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Floriculture.

Professor THAYER, Assistant Professor MULLER.

The courses in floriculture are intended to present a general knowledge of all phases of greenhouse design, construction, heating and management, the culture of florists' crops (under glass and in the field), floral decoration and arrangement. The department aims to train students so that they may take up commercial floriculture (either in the growing or retail business) and the management of conservatories on private estates, in parks and cemeteries.

The department is especially well equipped for the teaching work, probably being surpassed in no other agricultural college. French Hall, with its laboratories, classrooms and offices, furnishes excellent facilities for the purposes of instruction. The glass area of the department consists of approximately 20,000 square feet, divided as follows: French Hall range of 7,200 square feet, a durable, practical, commercial range composed of palm and fern, violet, carnation, rose and students' houses; the old Durfee range of 7,400 square feet, devoted to the growing of decorative, conservatory and bedding plants and chrysanthemums; one house of 3,200 square feet, suitable for propagating work and general plant culture; and approximately 2,200 square feet in cold frames and hotbeds.

In addition, the department has 2 acres of land used for the summer culture of carnations, violets, gladioli, dahlias, sweet peas, bedding plants, etc. This also includes a small garden of about 4,700 square feet devoted to the culture of annuals. A large collection of biennials and herbaceous perennials is maintained and is being

enlarged from year to year; at the present time the collection consists of several hundred species and varieties, and provides an excellent opportunity for the study of garden flowers.

Elective Courses.

50. **I. GREENHOUSE MANAGEMENT.** — For juniors; seniors may elect. Designed to familiarize students with the methods followed in the management of greenhouses and of greenhouse crops and the principles underlying the same; history and development of the floricultural industry; preparation of soils; fertilizers; potting; watering; ventilation; control of insects and diseases; methods of plant propagation; forcing of plants. At some time during the term the members of the class will be required to take a one-day trip to visit large commercial establishments. Lectures, assigned readings, reports and laboratory practice.

2 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 9.

Professor THAYER.

Prerequisite, Horticulture 25 and 26.

51. **II. GREENHOUSE MANAGEMENT.** — For juniors; seniors may elect. Continuation of Course 50. Several field trips, to study floricultural establishments in the vicinity, will be made during the laboratory periods.

2 class hours.

1 4-hour laboratory period, 3 study hours, credit, 9.

Professor THAYER.

52. **III. FLORAL ARRANGEMENT.** — A study of the principles underlying the arrangement and use of cut flowers and plants; funeral designs, basket and vase arrangement, table decorations, home, church and all interior decorations; a study of color as applied to such work. Lectures, assigned readings and reports. This course will be limited to ten students.

2 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 9.

Professor THAYER.

53. **I. GREENHOUSE CONSTRUCTION AND HEATING.** — For juniors; seniors may elect. The location, types, arrangement, construction, cost, equipment, heating and ventilating of greenhouse structures; the drawing of plans and study of specifications for commercial houses and conservatory ranges. Such practical work as glazing and the construction of concrete benches and cold frames is included as facilities allow. Lectures, assigned readings and problems.

3 class hours.

1 2-hour laboratory period, 3 study hours, credit, 8.

Professor THAYER.

55. **III. GARDEN FLOWERS AND BEDDING PLANTS.** — For juniors and seniors. A study of the annuals, biennials, herbaceous perennials, bulbs, bedding plants and roses that are valuable for use in floricultural or landscape gardening work. Methods of propagation, culture and uses of the various plants are considered; identification of material. Lectures, assigned readings and reports.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Professors THAYER and MULLER.

75. **I. COMMERCIAL FLORICULTURE.** — For seniors. A detailed study of the important commercial cut flower crops and potted plants. Visits will be made to commercial establishments during the term. The lectures are supplemented with textbooks and assigned readings.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor MULLER.

Prerequisite, Floriculture 51.

76. **II. COMMERCIAL FLORICULTURE.** — For seniors. As stated under Course 75.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor MULLER.

Prerequisite, Floriculture 75.

77. **III. COMMERCIAL FLORICULTURE.** — For seniors. As stated under Course 75.

2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Assistant Professor MULLER.

Prerequisite, Floriculture 76.

79. **II. CONSERVATORY PLANTS.** — For seniors. A study of the foliage and flowering plants used in conservatory work; methods of propagation, culture, use and arrangement; identification of plants. Lectures, assigned readings and reports.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Professor THAYER.

Prerequisite, Floriculture 51.

80. **III. SEMINAR.** — For seniors majoring in floriculture. Advanced study of subjects pertaining to some phase of floriculture. All students are assigned specific problems and pursue study in these problems by reading and research; the results of this study must be presented in the form of a thesis. Seminars are conducted weekly.

1 class hour. 2 to 4 laboratory hours, 2 to 4 study hours, not to exceed 9 credits.
Professor THAYER.

Forestry.

Professor GROSE.

The forestry courses are intended primarily for prospective owners or managers of farm woodlots, and the field work is focused on typical New England problems. These courses are broad enough, however, to furnish valuable preparation for students planning to study forestry in graduate schools.

The department has an unusually complete equipment of the various instruments used in forest mensuration, forest mapping and engineering, timber estimating, log scaling, board measuring, etc.; and a large assortment of boards illustrative of the various commercial woods found in the lumber markets. The State Forest Nursery, comprising 6 acres of land and containing, approximately, 5,000,000 trees, transplants and seedlings, is on the college farm. Forests containing every variety of tree common to New England are within walking distance of the college. The college campus affords an arboretum containing a large number of trees not native to New England. The Mount Toby Demonstration Forest has an area of approximately 750 acres, and contains the various types of forest growth found throughout the State. It serves as a field laboratory in which students have the privilege of working out problems in silviculture, forest mensuration and management. Improvement cuttings, cuttings for utilization, and forest plantings are conducted by the department.

55. **I. WOODLOT FORESTRY: ESTIMATING AND BUSINESS MANAGEMENT.** — For juniors and seniors. Topics: forest mapping; timber-cruising, determining rate of growth and possible cut; financial returns; forest taxation; our national timber supply, present and future.

1 2-hour and 1 4-hour laboratory period, 1 study hour, credit, 7.
Professor GROSE.

56. **II. WOODLOT FORESTRY: LOGGING, MILLING AND MARKETING.** — For juniors and seniors. Topics: felling trees; sawing logs; hauling logs; the portable mill; the stationary mill; seasoning, measuring and shipping lumber; lumber grades and prices; legal forms; by-products of the woodlot; adaptability of species to uses; wood-using industries of Massachusetts.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Professor GROSE.

57. **III. WOODLOT FORESTRY: TIMBER-RAISING.** — For juniors and seniors. Topics: forest planting; weeding; release cuttings; pruning; thinning; salvage cutting; protection from insects, fungi, fire, etc.; final cutting methods for natural reproduction of the forest.

1 2-hour and 1 4-hour laboratory period, 1 study hour, credit, 7.
Professor GROSE.

58. **III. WOODLOT FORESTRY: BRIEF SURVEY.** — A condensation of Courses 55, 56 and 57 for those who have only one term to give to forestry.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Professor GROSE.

Horticultural Manufactures.

Professor CHENOWETH, Mr. ROBERTSON.

The courses aim to give a practical knowledge of the problems connected with food preservation. Emphasis is placed upon the conservation of the cheaper grades of fruits and vegetables, to the end that the whole crop may be marketed at a profit and that wholesome food products may result from what would otherwise be lost. The social and economic values of this work are constantly emphasized.

The department occupies three laboratory rooms in Flint Laboratory, two in Fisher Laboratory, with offices in Wilder Hall and French Hall. The general equipment of the department, both for the use of students and for manufacturing purposes, may be grouped under the following heads: —

1. *Canning.* — A modern canning outfit, including both steam-pressure cookers and hot-water baths, hand and power can sealers, peeling and slicing machines, a string bean cutter, heat-penetration thermometers, electric incubator and a large assortment of all types of home canning equipment.

2. *Evaporation.* — Two small orchard evaporators, a tunnel-drier, peeling machines, slicers and a general assortment of driers adapted to home evaporation.

3. *Fruit Juices, Butters, etc.* — A hand cider mill, a motor-driven hydraulic press, a steam-jacketed kettle, an apple-butter cooker, and cider and vinegar testing apparatus.

Elective Courses.

75. **I. HORTICULTURAL MANUFACTURES.** — For seniors and graduate students. A practical course in food preservation dealing primarily with fruits and vegetables. The canning of fruits and vegetables as practiced in the home and in commercial canneries; evaporation of fruits and vegetables, the various types of equipment and methods of preparation of products. The manufacture of (a) fruit products, such as butters, jams, jellies, fruit juices, marmalades, preserves, vinegars, pastes, etc.; (b) vegetable products, as pickles, piccalilli, sauerkraut, soups, etc. Particular attention is given to study and use of all types of equipment suitable for use in the home or small factory, together with methods for testing a large variety of manufactured products. The emphasis is on canning, drying and study of equipment.

2 class hours. 3 2-hour laboratory periods, 4 study hours, credit, 12.
Professor CHENOWETH.

76. **II. HORTICULTURAL MANUFACTURES.** — For seniors and graduate students. A continuation of Course 75. The emphasis in this course is placed on the manufacturing and testing of fruit and vegetable products.

1 class hour. 2 2-hour laboratory periods, 3 study hours, credit, 8.
Professor CHENOWETH.

Prerequisite, Horticultural Manufactures 75.

77. **III. HORTICULTURAL MANUFACTURES.** — Continuation of courses 75 and 76, dealing primarily with maple products, the canning of meats and spring vege-

tables, and studies of special problems involved in establishing and operating home and farm factories.

2 2-hour laboratory periods, 2 study hours, credit, 6.
Professor CHENOWETH.

78. **III. HORTICULTURAL MANUFACTURES.** — For seniors and graduate students. A general course in food preservation, including lectures, readings and laboratory work in the canning and evaporation of fruits and vegetables, the manufacture of fruit and vegetable products. Special emphasis will be given to the conservation of the low grade fruits and vegetables in the home and in the farm factory.

2 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 9.
Professor CHENOWETH.

Horticulture.

Professor WAUGH, Professor THOMPSON, Assistant Professor ROGERS, Assistant Professor DICKINSON.

The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening and vegetable gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.

Elective Courses (General).

50. **I. PLANT MATERIALS.** — For juniors; seniors may elect. Aims to make the student familiar with the character of the trees, shrubs and herbaceous perennials used in ornamental work, and with the methods of propagating them.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.
Professor THOMPSON.

51. **III. PLANT MATERIALS.** — For juniors; seniors may elect. A continuation of Course 50, taking up the field use of trees, shrubs and herbaceous plants, their native habitats, soils and plant associations, with a view to supplying to students in landscape gardening and floriculture a knowledge of plant species. Frequent practicums and field excursions.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.
Professor THOMPSON.

Prerequisite, Horticulture 50.

Landscape Gardening.

Professor WAUGH, Assistant Professor HARRISON, Assistant Professor FRENCH.

The purposes of the courses are: (1) To train men for the profession in all its branches. As a rule graduates should first enter the employ of established landscape architects, nurserymen or park superintendents, and after an apprenticeship of several years those who have the requisite technical and business ability may set up for themselves. (2) To train men for public-service work in national, State and municipal parks and forests. (3) To train men for country planning, this function being exercised through various public institutions and organizations. (4) To train teachers and extension workers in lines of landscape gardening and civic improvement. (5) To give a broad and liberal general education stressing the fundamental principles of art.

The department has large, well-lighted drafting rooms, with necessary equipment, such as planimeters, eidograph, pantograph, blue-printing outfit, etc.; and a complete outfit of surveying instruments, including transits, levels, plane tables, prismatic compasses, hand levels, etc. The college campus presents an unusually good collection of the plant materials used in landscape gardening.

Elective Courses.

50. **I. MAPPING AND TOPOGRAPHY.** — For juniors. Reconnaissance surveys and mapping, with special reference to the methods used in landscape gardening; detailed study of selected designs of leading landscape gardeners; grade design, road design and field work. Must be followed by Course 51.

2 2-hour laboratory periods; 2 3-hour laboratory periods, credit, 10.

Assistant Professor HARRISON.

Prerequisites, Mathematics 26 and 27, Drawing 25, 26 and 27.

51. **II. ELEMENTS OF LANDSCAPE GARDENING.** — For juniors. As stated under Course 50.

3 3-hour laboratory periods, 2 study hours, credit, 11.

Assistant Professor HARRISON.

Prerequisite, Landscape Gardening 50.

52. **III. GENERAL DESIGN.** — For juniors. Field notes; examination of completed works and those under construction; design of architectural details, planting plans, gardens, parks and private grounds; written reports on individual problems.

2 2-hour laboratory periods; 2 3-hour laboratory periods,
2 study hours, credit, 12.

Assistant Professor HARRISON.

Prerequisites, Landscape Gardening 50 and 51, and either plant materials (Horticulture 50 and 51) or advanced mathematics.

75. **I. THEORY OF LANDSCAPE ART.** — For seniors and graduates. The general theory and applications of landscape study, including a brief history of the art.
3 class hours.

3 study hours, credit, 6.

Professor WAUGH.

76. **I. CIVIC ART.** — For seniors. The principles and applications of modern civic art, including city planning, city improvement, village improvement and rural improvement, with special emphasis upon country planning. Must be followed by Course 77.

3 3-hour laboratory periods, 1 study hour, credit, 10.

Assistant Professor ROGERS.

Prerequisite, Landscape Gardening 52.

77. **III. COUNTRY PLANNING.** — For seniors. As stated under Course 76.

3 3-hour laboratory periods, 3 study hours, credit, 12.

Professor WAUGH.

Prerequisite, Landscape Gardening 76.

78. **I. ARCHITECTURE.** — Alternating with Course 79; given in 1924-25. For juniors and seniors. The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, conferences, practice in designing.
3 class hours.

6 study hours, credit, 9.

Assistant Professor HARRISON.

79. **I. CONSTRUCTION AND MAINTENANCE.** — Alternating with Course 78; given in 1925-26. For juniors and seniors. Detailed instruction in methods of construction and planting in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc.
3 class hours.

6 study hours, credit, 9.

Assistant Professor HARRISON.

80. **II. THEORY OF DESIGN.** — For juniors. As stated under Course 52.
3 class hours. 9 study hours, credit, 12.
Professor WAUGH.

Prerequisite, Landscape Gardening 52.

81. **II. ESTATE DESIGN.**

3 3-hour laboratory periods, 3 study hours, credit, 12.
Assistant Professor HARRISON.

82. **III. PARK DESIGN.**

3 3-hour laboratory periods, 3 study hours, credit, 12.
Assistant Professor HARRISON.

Pomology.

Professor SEARS, Professor VAN METER, Assistant Professor DRAIN, Mr. FRENCH, Mr. RALEIGH.

The object of the course is to give a training which shall be thoroughly practical and yet scientific. This will fit the men to enter the field of practical fruit growing, or it will furnish an excellent foundation for further study.

The department has 50 acres in fruit plantations. The apple orchards comprise about 35 acres, and there are blocks of pears, peaches, plums and cherries. In small fruits there are plantings of strawberries, raspberries, blackberries, currants and gooseberries. There are three vineyards, with a total area of 5 acres, in which the leading varieties and the principal types of pruning and training are represented. In these plantations are 50 varieties of grapes, representing three native American species and many hybrids; 20 varieties of peaches; 20 varieties of pears; 25 of plums, including five species and many hybrids; and 100 varieties of apples.

The department has an excellent equipment of spraying and dusting machinery, including various styles and sizes of power sprayers, and many types of barrel pumps and smaller sprayers. There is also an excellent assortment of orchard tools, including plows, harrows, fertilizer sowers, etc.

Fisher Laboratory is one of the best planned and equipped packing and storage plants in the United States. It includes six refrigerated rooms; four storage rooms not refrigerated; one large laboratory room and one classroom, besides ample storage room for fruit packages and equipment. The equipment for the building itself includes four types of apple sizers; packing tables and box and barrel presses of various types, besides all kinds of packages and the smaller equipment necessary for thoroughly modern work in grading and packing fruit. The department is equipped with lockers and with pruning and other tools for the use of students in laboratory work, which is made a leading feature in all the courses in pomology.

Elective Courses.

50. **I. PRACTICAL POMOLOGY.** — For juniors; seniors may elect. A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of nursery stock, pruning, culture of orchards, orchard fertilizers, cropping orchards, etc. Lectures, supplemented with text and reference books; field and laboratory exercises.
2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Professor SEARS and Mr. FRENCH.

Prerequisite, Horticulture 26.

51. **II. PRACTICAL POMOLOGY.** — For juniors; seniors may elect. As stated under Course 50.
2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Professor SEARS and Mr. FRENCH.

Prerequisite, Pomology 50.

52. **III. SMALL FRUITS.** — For juniors; seniors may elect. A study of the growing of small fruits, including raspberries, blackberries, strawberries, currants, gooseberries and grapes, dealing with such questions as their propagation, selecting a site for the plantation, soils, fertilizers, pruning, etc.

2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Professor SEARS and Mr. FRENCH.

Prerequisite, Pomology 51.

54. **II. SYSTEMATIC POMOLOGY.** — For juniors. A study of the varieties and nomenclature of the different fruits, with critical descriptions; special reference given to relationships and classification. Lectures, laboratory and field exercises.

1 class hour. 2 2-hour laboratory periods, 3 study hours, credit, 8.
Assistant Professor DRAIN.

Prerequisite, Pomology 50.

75. **I. SYSTEMATIC POMOLOGY.** — For seniors. As stated under Course 54.

1 class hour. 2 2-hour laboratory periods, 3 study hours, credit, 8.
Assistant Professor DRAIN.

Prerequisite, Pomology 54.

76. **II. ORCHARD MANAGEMENT.** — For seniors. Consideration will be given to the organization of a fruit farm to secure the most satisfactory distribution of income and of labor requirements. The costs of operations will be studied in connection with the keeping of orchard accounts and the estimation of supplies and equipment. The course will include a series of problems dealing with the application of principles learned in previous courses.

2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Professor VAN METER.

Prerequisite, Pomology 51.

77. **I. COMMERCIAL POMOLOGY.** — For seniors. The picking, handling, storing and marketing of fruits, including a discussion of storage houses, fruit packages, methods of grading and packing. Especial emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of all the principal fruits.

1 class hour. 2 2-hour laboratory periods, 3 study hours, credit, 8.
Mr. RALEIGH.

Prerequisite, Pomology 51.

78. **III. SPRAYING.** — For seniors. A study of (a) spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material, formulas used, cost, tests of purity. (b) Spraying machinery, including all the principal types of pumps, nozzles, hose and vehicles; their structure and care. (c) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small-fruit plantations.

1 class hour. 2 2-hour laboratory periods, 3 study hours, credit, 8.
Assistant Professor DRAIN.

Prerequisite, Pomology 76.

79. **II. GENERAL POMOLOGY.** — For seniors; juniors may elect. Planned to meet the needs of students who cannot devote more than one term to the subject but who want a general knowledge of fruit growing. Consists of lectures and laboratory exercises on such topics as choosing the locations, kinds and varieties

of fruits to grow, securing and setting the plants, care and cultivation, pruning, spraying, pests, harvesting and storing.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor DRAIN.

80. **I. SEMINAR.** — For seniors majoring in pomology. Advanced study of problems relating to the business of fruit growing. Each student is assigned a major and a minor problem in lines of work in which he is particularly interested. He pursues his studies both by reading and research, and the materials obtained will be worked into theses which are presented to the seminar for discussion. No lectures are given, but seminar meetings are held for one period each week.

1 class hour.

1 study hour, credit, 2.

The DEPARTMENT.

81. **II. SEMINAR.** — For seniors majoring in pomology. A continuation of Course 80. One seminar meeting each week.

1 class hour.

1 study hour, credit, 2.

The DEPARTMENT.

82. **III. SEMINAR.** — For seniors majoring in pomology. A continuation of Course 81. One seminar meeting each week.

1 class hour.

1 study hour, credit, 2.

The DEPARTMENT.

Vegetable Gardening.

Professor WAUGH, — — —, Mr. SNYDER.

The courses in Vegetable Gardening are designed for students who wish to enter commercial vegetable growing, the seed business, or professional work, such as teaching or experimental work. Each of these fields offer wide possibilities and the advancement of vegetable production will depend upon the number and quality of the men trained along these lines.

The department has ten acres of land, 3,800 sq. ft. of greenhouse space, and 150 hotbed sash, all of which are used to provide laboratory facilities. Part of this equipment is used for the non-commercial laboratory work, such as the students' gardens and the type and variety garden, while the remainder is devoted to commercial laboratory work.

In addition the department maintains at Waltham, Massachusetts, the Market Garden Field Station. Here the experimental and extension work of the department is carried on.

Elective Courses.

50. **III. GENERAL VEGETABLE GARDENING.** — For juniors; seniors may elect. A general course for those students who desire a general knowledge of agriculture, but do not care to spend the time for extreme specialization. Designed to teach the fundamentals of vegetable growing so they may be applied (1) to the growing of vegetables commercially as a cash crop with other types of agriculture, (2) to the growing of vegetables in the home garden, (3) to agricultural teaching in secondary schools, and (4) to professional agricultural work other than teaching.

3 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 10.

52. **II. PRACTICAL VEGETABLE GARDENING.** — For juniors; seniors may elect. Courses 52 and 53 are designed for those students who wish to obtain a knowledge of vegetable growing in order that they may apply this to the successful commercial production of vegetables, or to become fitted for professional work such as teaching and research work. The course begins with a consideration of vegetables as a food, the part they play in the food supply of the city, state, or nation, and Massachusetts' part in this type of food production, followed by a study of the fundamentals

of vegetable gardening. Deals with such questions as the selection of a location; soils, manures and fertilizers, green manures and cover crops; seeds and seeding; planting, tillage, irrigation; control of insects and diseases. Includes a detailed study of the cultural requirements of the common vegetable crops, and the principles of rotation and double cropping. Text and reference books. Laboratory and field exercises.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.

Prerequisites, Horticulture 26, Agronomy 75.

53. **III. PRACTICAL VEGETABLE GARDENING.** — For juniors; seniors may elect. As stated under Course 52.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.

Prerequisite, Vegetable Gardening 52.

75. **I. TYPES AND VARIETIES.** — For seniors. Includes the systematic study of types, varieties and strains of the leading vegetable crops; exhibiting and judging of vegetables; determination of quality in vegetables; seed growing, variety improvement, rogueing, seed harvesting, curing and storing.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.

Prerequisite, Vegetable Gardening 53 or 50.

76. **II. VEGETABLE FORCING.** — For seniors. A study of types, materials, construction, location, arrangement, capacity and cost of greenhouses for growing vegetables. A brief consideration of the heating plant, — the type, installation, piping and management; also the study of greenhouse vegetable crops and their production as practiced by commercial growers.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.

Prerequisite, Vegetable Gardening 53 or 50.

77. **III. COMMERCIAL VEGETABLE GROWING.** — For seniors. A consideration of vegetable growing as a business. A study of this specialized type of farming, including places where developed, types, extent, economic importance, capitalization, equipment and other fundamental problems of commercial vegetable gardening. Students assist in the planning and operation of a typical market-gardening area. Visits are made to market-gardening and truck-gardening farms.

3 class hours. 2 2-hour laboratory periods, 3 study hours, credit, 10.

Prerequisite, Vegetable Gardening 53 or 50.

Drawing.

— —.

Required Courses.

25. **I. FREE-HAND DRAWING.** — For sophomores; juniors and seniors may elect. Lettering; free-hand perspective; sketching from type models, leaves, flowers and trees, houses, etc.; laying flat and graded washes in water colors; water-color rendering of leaves, flowers and trees; conventional coloring and map rendering in water-colors; conventional signs and mapping in ink.

4 2-hour laboratory periods, credit, 8.

26. **II. MECHANICAL DRAWING.** — For sophomores; juniors and seniors may elect. Inking exercises; geometric problems; projection; intersections; isometric;

shades and shadows; parallel; angular and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry.

3 2-hour laboratory periods, credit, 6.

27. **III. MECHANICAL DRAWING.** — For sophomores; juniors and seniors may elect. As stated under Course 26.

4 2-hour laboratory periods, credit, 8.

Prerequisite, Drawing 26.

DIVISION OF SCIENCE.

Professor FERNALD.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Botany.

Professor OSMUN, Assistant Professor CLARK, Assistant Professor McLAUGHLIN, Assistant Professor TORREY, Assistant Professor DAVIS.

A knowledge of the principles of plant life is fundamental in agricultural education. The required courses in botany are planned with this and the general educational value of the subject in view. Elective courses are of two types: (1) those which have for their chief aim the direct support of technical courses in agriculture and horticulture, and (2) those providing broader, more intensive training in the science. Courses in the second group may lead, when followed by postgraduate study, to specialization in the field. They also furnish excellent training for those specializing in other sciences and in scientific agriculture. In all undergraduate courses the relation of the science of botany to agriculture is emphasized.

The department occupies Clark Hall, a brick building 55 by 95 feet, two stories high, with basement and attic. The building has two lecture rooms with seating capacity of 154 and 72, respectively; one seminar and herbarium room; large laboratories for general and special work; and smaller rooms for advanced students. A glass-enclosed laboratory for plant physiology adjoins the main building and provides unusual facilities for the study of phenomena of plant life. In addition, a greenhouse 28 by 70 feet is connected with the building. This is for experimental work in plant pathology and physiology, and for growing plants needed for instruction. The experiment station laboratories devoted to botanical research are in this building.

The laboratories and lecture rooms are of modern construction, finely lighted, and equipped with compound and dissecting microscopes, microtomes, paraffin and drying ovens, physiological and other apparatus, and a large collection of charts. The herbarium contains about 20,000 sheets of seed plants and ferns, 1,200 sheets of liverworts and mosses, and 25,000 specimens of fungi. Facilities and equipment for the study of plant physiology and pathology are excelled in few other institutions.

Required Courses.

3. **III. INTRODUCTORY BOTANY.** — For freshmen. Presents the seed plants as plastic organisms molded by their environment. Also introduces the student to methods of identifying and classifying plants.

2 class hours.

2 2-hour laboratory periods, 4 study hours, credit, 10.

Assistant Professor TORREY.

25. **I. INTRODUCTORY BOTANY.** — For sophomores. The anatomy and physiology of the seed plants (Phanerogamia).

1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.

Assistant Professor TORREY.

Prerequisite, Botany 3.

26. **III. MORPHOLOGY AND TAXONOMY OF THE LOWER PLANTS (CRYPTOGAMIA).** — For sophomores. Systematic study of typical forms of bacteria, algæ, fungi, lichens, mosses, ferns. (Courses 3, 25 and 26 constitute a general elementary course in botany, and are required of all students who major in science.)
1 class hour. 3 2-hour laboratory periods, 2 study hours, credit, 9.

Professors OSMUN and McLAUGHLIN.

Prerequisite, Botany 25.

Elective Courses.

50. **I. DISEASES OF CROPS.** — For juniors; seniors may elect. The lectures are general and are taken by all who elect the course, but in order to permit students to specialize on the diseases of crops most closely related to their majors or in which they are most interested, the course is divided for laboratory work into the following sections: (I) diseases of truck and field crops; (II) diseases of floricultural crops and ornamentals; (III) diseases of fruit crops; (IV) diseases of shade and forest trees. One, two or three laboratory sections may be taken.
1 class hour.

1, 2 or 3 2-hour laboratory periods, 3 study hours, credits, 6, 8 or 10.

Assistant Professor McLAUGHLIN.

Prerequisites, Botany 3 and 25.

51. **II. DISEASES OF CROPS.** — For juniors; seniors may elect. As stated under Course 50.
1 class hour.

1, 2 or 3 2-hour laboratory periods, 3 study hours, credits, 6, 8 or 10.

Assistant Professor McLAUGHLIN.

Prerequisite, Botany 50.

52. **I. SYSTEMATIC MYCOLOGY.** — For juniors; seniors may elect. Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection and preservation of fungi; study of system of classification; collateral reading. A prerequisite of the senior course in plant pathology, but open to all.

1 class hour. 2 2-hour laboratory periods, 2 study hours, credit, 7.

Assistant Professor DAVIS.

Prerequisite, Botany 26.

53. **II. SYSTEMATIC MYCOLOGY.** — For juniors; seniors may elect. As stated under Course 52.
1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.

Assistant Professor DAVIS.

Prerequisite, Botany 52.

54. **III. SYSTEMATIC MYCOLOGY.** — For juniors; seniors may elect. As stated under Course 52.
1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.

Assistant Professor DAVIS.

Prerequisite, Botany 53.

55. **III. PLANT HISTOLOGY.** — For juniors; seniors may elect. Comparative study of the tissues of plants; training in histological methods, including the use of precision microtomes, methods of killing, fixing, sectioning, staining and mounting; collateral reading and conferences. This course offers valuable training in preparation for further work in botany.

5 2-hour laboratory periods, credit, 10.

Assistant Professors McLAUGHLIN, TORREY and DAVIS.

Prerequisite, Botany 3 and 25.

58. **I. SYSTEMATIC BOTANY OF THE HIGHER PLANTS (1924-25).** — For juniors and seniors. An intensive study of gymnosperms and angiosperms. Lectures deal with the interrelations of the flowering plants and with their ecology, distribution and economic importance. Laboratory work consists of a critical study of types from the most important natural plant families. Particular emphasis is laid on the flora of Massachusetts. The department herbarium and greenhouses supply material of important tropical forms for study. Alternates with Course 61.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Assistant Professor TORREY.

59. **II. SYSTEMATIC BOTANY OF THE HIGHER PLANTS (1924-25).** — For juniors and seniors. As stated under Course 58. Alternates with Course 62.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Assistant Professor TORREY.

60. **III. SYSTEMATIC BOTANY OF THE HIGHER PLANTS (1924-25).** — For juniors and seniors. As stated under Course 58. Alternates with Course 63.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Assistant Professor TORREY.

61. **I. THE COMPARATIVE ANATOMY OF GREEN PLANTS (1925-26).** — For juniors and seniors. In the lectures an intensive study is directed to the comparative anatomy of green plants from the evolutionary standpoint. Particular emphasis is laid upon the woody forms both living and extinct. Of the latter, the department is fortunate in possessing excellent sets of micro-preparations and lantern slides. Alternates with Course 58.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Assistant Professor TORREY.

62. **II. THE COMPARATIVE ANATOMY OF GREEN PLANTS (1925-26).** — For juniors and seniors. As stated under Course 58. Alternates with Course 59.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Assistant Professor TORREY.

63. **III. THE COMPARATIVE ANATOMY OF GREEN PLANTS (1925-26).** — For juniors and seniors. As stated under Course 58. Alternates with Course 60.

2 class hours. 1 2-hour laboratory period, 4 study hours, credit, 8.
Assistant Professor TORREY.

75. **I. PLANT PATHOLOGY.** — For seniors. Comprehensive study of diseases of plants; training in laboratory methods and technique, including culture work and artificial inoculation of hosts; miscellaneous diagnosis; study of literature and representative life histories of pathogens. Prepares for civil service, experiment station and college work.

1 class hour. 4 2-hour laboratory periods, 2 study hours, credit, 11.
Professors OSMUN and DAVIS.

Prerequisite, Botany 54.

76. **II. PLANT PATHOLOGY.** — For seniors. As stated under Course 75.

1 class hour. 4 2-hour laboratory periods, 2 study hours, credit, 11.
Professors OSMUN and DAVIS.

Prerequisite, Botany 75.

77. **III. PLANT PATHOLOGY.** — For seniors. As stated under Course 75.

1 class hour. 4 2-hour laboratory periods, 2 study hours, credit, 11.
Professors OSMUN and DAVIS.

Prerequisite, Botany 76.

78. **I. PLANT PHYSIOLOGY.** — For seniors. Study of the factors and conditions of (a) Plant Nutrition, including the taking up of water and mineral substances, the assimilation of carbon and nitrogen, and the release of energy due to the processes of dissimilation; (b) Plant Growth, including the influence of internal and external factors on growth, the development of reproductive and vegetative organs; (c) Plant Movements, including those due to the taking up of water, and those movements of both motile and fixed forms in response to external stimuli. Weekly conferences are held at which students report on assignments to original sources in the literature.

2 class hours. 3 2-hour laboratory periods, 2 study hours, credit, 10.
Assistant Professor CLARK.

Prerequisites, Botany 26 and Chemistry 51.

79. **II. PLANT PHYSIOLOGY.** — For seniors. As stated under Course 78.
2 class hours. 1 or 3 2-hour laboratory periods, 2 study hours, credit, 6 or 10.
Assistant Professor CLARK.

Prerequisite, Botany 78 for the 10-credit course, Botany 25 for the 6-credit course.

80. **III. PLANT PHYSIOLOGY.** — For seniors. As stated under Course 78.
2 class hours. 1 or 3 2-hour laboratory periods, 2 study hours, credit, 6 or 10.
Assistant Professor CLARK.

Prerequisite, Botany 79.

General and Agricultural Chemistry.

Professor LINDSEY, Professor CHAMBERLAIN, Professor PETERS, Assistant Professor SEREX, Mr. PHILLIPS.

In teaching the courses in chemistry, emphasis is laid on both their educational and their vocational value. The courses in the freshman year deal with fundamental principles, and give the student such an understanding of the subject as will enable him to apply it in farm practice. The more advanced courses, including quantitative analysis and organic, physiological and physical chemistry, are for those who intend to become teachers and workers in the allied sciences, or who desire to follow agricultural chemistry as a vocation. Advanced training is given by means of postgraduate courses (see Graduate School).

Those completing the undergraduate courses are fitted for positions in the agricultural industries, — fertilizer, feed and insecticide manufacture, — as well as in other lines of industry, and in the State experiment stations, in commercial laboratories, and in high school teaching. Postgraduate students are prepared for positions as teachers in colleges, and for more advanced positions in industry and in the experiment stations.

The new Goessmann Chemistry Laboratory was opened for classes in September, 1924.

Required Courses.

The freshman work consists of two distinct parts: Courses 1 and 2 contain more hours and are for those who have had no chemistry in the secondary schools, and Courses 4 and 5 are for those who have presented chemistry for entrance. Both groups of courses bring the student out at the same point. It is obviously to the advantage of the student to take a course in chemistry in high school and thus obviate the extra hours of Courses 1 and 2 in the freshman year.

1. **I. GENERAL CHEMISTRY.** — For freshmen. This course is for those students who do not present chemistry for entrance and who begin the subject in college. An introduction to the fundamental chemical laws, together with a study of the common acid-forming elements and their compounds.

3 class hours. 2 2-hour laboratory periods, 5 study hours, credit, 12.
Professor PETERS.

2. **II. AGRICULTURAL CHEMISTRY.** — For freshmen. The preparation of a number of substances important in agriculture, such as superphosphate, ammo-

mium sulfate, muriate and sulfate of potash, Paris green, arsenate of lead, Bordeaux mixture, lime-sulfur and emulsions. These materials are prepared in the laboratory and studied in detail in the classroom; some of the substances prepared may be analyzed. Particular attention will be given to a study of the composition, properties and reactions of soils. Approximate quantitative determinations of a number of constituents of soils and fertilizers will be made.

3 class hours.

2 2-hour laboratory periods, 5 study hours, credit, 12.

Professor PETERS.

4. **I. ADVANCED GENERAL CHEMISTRY.** — For freshmen. A review of the fundamental chemical laws, together with the common acid and base-forming elements and their compounds. Textbook, Holmes' "General Chemistry." The laboratory work takes the synthetic form. Substances of agricultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur and emulsions.

2 class hours.

2 2-hour laboratory periods, 4 study hours, credit, 10.

Assistant Professor SEREX.

Prerequisite, Entrance Chemistry.

5. **II. INORGANIC AGRICULTURAL CHEMISTRY.** — For freshmen. A study of the chemical composition, properties and reactions of soils, fertilizers, fungicides and insecticides. The laboratory work is divided into three parts: (a) qualitative examination of soil, plant ash and superphosphate; (b) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, etc.; (c) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc.

2 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 9.

Assistant Professor SEREX.

25. **I. QUALITATIVE ANALYSIS.** — *Basic.* — For sophomores. The systematic analysis of metallic salts, presented from the ionic viewpoint. A close study of the tests used in the separation and identification of the metals, and the application of these tests to unknown mixtures. Text, Medicus' "Qualitative Analysis," with Stieglitz's "Qualitative Analysis" and Gooch and Browning's "Qualitative Analysis" for reference. This course should be taken by all intending to follow chemistry as a vocation.

1 class hour.

2 2-hour laboratory periods, 4 study hours, credit, 9.

Assistant Professor SEREX.

Prerequisite, Chemistry 2 or 5.

26. **II. QUALITATIVE ANALYSIS.** — *Acidic.* — For sophomores. A continuation of Course 25.

1 class hour.

2 2-hour laboratory periods, 4 study hours, credit, 9.

Assistant Professor SEREX.

30. **II. ORGANIC AGRICULTURAL CHEMISTRY.** — For sophomores; juniors and seniors may elect. Embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar and alcohol. The treatment of the subject is general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products.

3 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 10.

Professor CHAMBERLAIN.

Elective Courses.

51. **I. ORGANIC CHEMISTRY.** — For juniors; seniors may elect. Consists of a systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those compounds which are found in agricultural products or are manufactured from them. These include alcohols, acids, esters, fats, carbohydrates and proteins. The work forms a foundation for courses in physiological chemistry and agricultural analysis, and is especially planned for those majoring in chemistry or the other sciences. Those electing Course 51 are expected to elect Course 52.
3 class hours. 2 3-hour laboratory periods, 3 study hours, credit, 12.

Professor CHAMBERLAIN.

Prerequisites, Chemistry 2 or 5, and Chemistry 26 for those majoring in chemistry.

52. **II. ORGANIC CHEMISTRY.** — For juniors; seniors may elect. A continuation of Course 51.
3 class hours. 2 3-hour laboratory periods, 3 study hours, credit, 12.

Professor CHAMBERLAIN.

53. **III. ORGANIC CHEMISTRY.** — For juniors; seniors may elect. A continuation of Courses 51 and 52, dealing principally with compounds of the benzene series.
3 class hours. 2 3-hour laboratory periods, 3 study hours, credit, 12.

Professor CHAMBERLAIN.

61. **I. QUANTITATIVE ANALYSIS.** — For juniors; seniors may elect. Includes the gravimetric and volumetric determinations of some of the commoner metals and non-metals. Smith's "Quantitative Chemical Analysis" is used as a text.
1 class hour. 2 4-hour laboratory periods, 3 study hours, credit, 12.

Professor PETERS.

Prerequisite, Chemistry 25. Course 26 is prerequisite for those majoring in chemistry.

62. **II. ADVANCED QUANTITATIVE ANALYSIS.** — For juniors; seniors may elect. Advanced work on subjects as stated under Course 61, together with the analysis of insecticides or the analysis of soils and fertilizers.
2 class hours. 2 4-hour laboratory periods, 2 study hours, credit, 12.

Professor PETERS.

Prerequisite, Chemistry 61.

63. **III. MILK AND BUTTER ANALYSIS.** — For juniors; seniors may elect. A study of milk and butter analytically.
1 class hour. 2 4-hour laboratory periods, 3 study hours, credit, 12.

Professor PETERS.

Prerequisite, Chemistry 61.

75. **I. PHYSICAL CHEMISTRY.** — For seniors. A résumé of general chemistry from the viewpoint of physical chemistry, and the application of physical chemistry to agricultural chemistry.
3 class hours. 6 laboratory hours, 3 study hours, credit, 12.

Assistant Professor SEREX.

Prerequisite, Chemistry 61.

80. **I. PHYSIOLOGICAL CHEMISTRY.** — For seniors. Supplementary to Courses 51, 52 and 53. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 51, 52 and 53, it gives acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied

in Courses 51, 52 and 53 are built up in the living organism or are used as food by it. In the lectures the study of food and nutrition as related to both human and domestic animals is the principal subject. In the laboratory experimental studies are made of the animal body and the processes and products of digestion, secretion and excretion.

3 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 10.

Professor CHAMBERLAIN.

86. **II. REVIEW OF GENERAL CHEMISTRY.** — For seniors. Primarily for students majoring in chemistry; others may elect by permission from the instructor. A knowledge of physical chemistry is desirable. The review of general chemistry is largely theoretical, using Alexander Smith's "Introduction to Inorganic Chemistry" as text.

3 class hours.

6 study hours, credit, 9.

Professor PETERS.

87. **III. HISTORY OF CHEMISTRY.** — For seniors. An historical and biographical study of chemistry and chemists. The aim of the course is: (1) to give the student a comprehensive view of the science as a whole, through a study of the development of new ideas and the establishment of new theories and laws; and (2) to arouse an enthusiastic interest in the subject and an appreciation of the true spirit of scientific research through a sympathetic presentation of the work and lives of the great chemists who have been the creators of the chemistry of to-day. The course will consist of lectures, supplemented by systematic correlated reading, and the preparation of reports or essays.

3 class hours.

6 study hours, credit, 9.

Professor CHAMBERLAIN.

90. **II. SPECIAL WORK IN CHEMICAL PROBLEMS.** — For seniors. The student is given a problem in analytical chemistry or one related to the agricultural industries. This is to acquaint him with the methods used in research and with chemical literature. Special subjects such as cattle feed or water analysis may be taken if desired.

8 laboratory hours, 4 study hours, credit, 12.

Professor PETERS.

91. **III. SPECIAL WORK IN CHEMICAL PROBLEMS.** — For seniors. As stated under Course 90.

8 laboratory hours, 4 study hours, credit, 12.

Professor PETERS.

92. **II. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.** — For seniors. In this course, as in Courses 90 to 95, the student may give his attention primarily to one line of chemical study. To those whose tastes and interests are in connection with the organic and physiological problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats, organic nitrogenous compounds in fertilizers and soils and their relation to plants, the commercial production of alcohol from agricultural products, dyes, digestion and dietary studies, the chemical study of dairy products, etc.

1 class hour.

8 laboratory hours, 3 study hours, credit, 12.

Professor CHAMBERLAIN.

Prerequisites, Chemistry 51, 52, 53 and 80.

93. **III. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.** — For seniors. As stated under Course 92.

1 class hour.

8 laboratory hours, 3 study hours, credit, 12.

Professor CHAMBERLAIN.

Prerequisite, Chemistry 92.

94. **II. SPECIAL WORK IN PHYSICAL CHEMISTRY.** — For seniors. The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. Each student selects one line of work and follows it through the course, repeating some of the original work.

1 class hour.

8 laboratory hours, 3 study hours, credit, 12.

Assistant Professor SEREX.

Prerequisite, Chemistry 75.

95. **III. SPECIAL WORK IN PHYSICAL CHEMISTRY.** — For seniors. As stated under Course 94.

1 class hour.

8 laboratory hours, 3 study hours, credit, 12.

Assistant Professor SEREX.

Prerequisite, Chemistry 94.

Entomology.

Professor FERNALD, Professor CRAMPTON, Assistant Professor ALEXANDER, Assistant Professor CASSIDY.

Introductory Course 26 or 28 presents a comprehensive view of the relation of insects to man, particularly as crop pests. The most important pests are carefully studied, together with the methods for their control. Courses 50 and 51 are arranged for special study of the pests of any one line of agricultural or horticultural occupation, selected by the student according to his plan of future work, with the intent of making him thoroughly familiar with the pests he will meet in his selected work after graduation, and the means of controlling them. The remaining courses are for the training of men as State or experiment station entomologists; for those going into the care of trees, etc., on estates, or for cities and towns; and as entomological experts, for which the demand has been very large.

Fernald Hall provides excellent lecture rooms and laboratories for this department. The laboratories are provided with individual desks, equipped with microscopes and all needed apparatus of all kinds. Dissecting microscopes, binoculars, microtomes, photographic apparatus, glassware and reagents are available for use and electric light and gas are connected with each desk. Two laboratories, one for juniors and seniors, the other for graduate students, are thus equipped. A department library containing all the more important works on insects, supplemented by others on the subject in the main library, and by the private libraries of the professors, make available more than 25,000 books and pamphlets on this subject. In addition, all the current magazines are received and their files are accessible to every one. A card catalogue giving references to the published articles on different insects contains about 65,000 cards, and is probably the largest index of its kind in the world. Spray pumps, nozzles and spraying appliances of all kinds are in use in various parts of the courses, and a large collection of insecticides is accessible for study. Photographic rooms are specially prepared for the photography of insects, and the greenhouses, gardens, orchards and the grounds of the college provide wide opportunities for the study, under natural conditions, of insect pests.

Course 26 or 28 is required of sophomores in the Divisions of Horticulture, Landscape Gardening, Science and Rural Social Science.

26. **III. GENERAL AND ECONOMIC ENTOMOLOGY.** — For sophomores; juniors and seniors may elect. For students who desire some knowledge of insects, but who cannot give more than one term to the subject; also an introduction to the later courses for those who intend to follow entomology further. Touches briefly upon the structure of insects so far as this is needed for such a course; deals with metamorphosis, classification to the larger groups, and discusses the most important methods and materials used for control. The greater part of the time is devoted to special study of the most important insect pests, particularly of New England,

showing their modes of life, the injuries they cause, and the best methods of control. In this way the most serious pests of fruit trees, ornamental trees and shrubs, market-garden and green-house pests, those attacking field crops and those affecting animals and man, are treated.

5 class hours.

4 study hours, credit, 9.
Professor FERNALD.

28. **III. GENERAL AND ECONOMIC ENTOMOLOGY.** — The same as 26 to about May 1; thereafter two class exercises and three laboratory or field exercises per week. In the field the work of insects found will be studied and collections of insects made. Methods of collecting, preparing and mounting insects for collections will be taught. Class limited to 30 members.

5 class hours, 4 study hours to about May 1;

2 class hours. 3 2-hour laboratory periods, 1 study hour thereafter, credit, 9.
Professor FERNALD.

50. **I. PESTS OF SPECIAL CROPS.** — For juniors; seniors may elect. For students not majoring in entomology. The laboratory work is largely individual in this term. Accordingly, students majoring in subjects other than entomology, but who desire a more complete knowledge of the insects connected with their own major line of work, can obtain it here. A student majoring in floriculture, for example, will devote his laboratory time to a careful study of the insects injuring floricultural crops, learning how to recognize them and their work in their different stages, and the best methods for their control. Courses of this kind are available on the insects attacking field crops, market-garden crops, tree fruits, small fruits, shade trees and shrubs, flowers, forest trees, the domesticated animals, household pests and man. This work may be continued in the winter term also. (See Course 51, **II.**)

3 2-hour laboratory periods, credit, 6.
Professor FERNALD.

Prerequisite, Entomology 26 or 28.

51. **II. PESTS OF SPECIAL CROPS.** — As stated in Course 50, **I.** For students not majoring in entomology. Those who were not able to take Entomology 50 in the fall may take it here. Those who took Entomology 50 in the fall have an opportunity to continue the work during this term also.

3 2-hour laboratory periods, credit, 6.
The DEPARTMENT.

Prerequisite, Entomology 26 or 28.

52. **I. CLASSIFICATION OF INSECTS.** — For juniors specializing in entomology. Laboratory work on the identification and classification of insects of various groups.

4 2-hour laboratory periods, credit, 8.
Assistant Professor ALEXANDER.

Accompanying Entomology 53.

53. **I. INSECT MORPHOLOGY.** — For juniors specializing in entomology and for other juniors or seniors having the prerequisite. The lectures treat of the external and internal anatomy of insects, particularly those parts used in identification, a knowledge of which is needed, in the accompanying Course 52. In the laboratory the external anatomy of the most important groups is studied, emphasizing the characters used in learning the names of insects, and to teach the methods of using analytical keys.

2 class hours. 3 2-hour laboratory periods, 4 study hours, credit, 12.
Professor CRAMPTON.

Prerequisite, Entomology 26 or 28.

54. **I. INSECTICIDES AND THEIR APPLICATION.** — Lectures on the composition, preparation and methods of application of Insecticides.
2 class hours, 2 study hours.

Credit, 4.

Professor FERNALD.

Prerequisite, Entomology 26 or 28.

55. **II.** Continuation of Course 52, one-half term. Insects and their relation to disease, one-half term.

4 2-hour laboratory periods, credit, 8.

Professors CRAMPTON and ALEXANDER.

56. **II. PESTS OF SPECIAL CROPS.** — For juniors majoring in entomology. Individual laboratory work on the most important insect pests of this country, and the preparation and presentation of bulletin material on them.

3 2-hour laboratory periods, credit, 6.

The DEPARTMENT.

75. **III. FOREST AND SHADE-TREE INSECTS.** — For juniors; seniors may elect. The lecture work deals with the principles and methods of controlling insects which attack forests and forest products, shade trees, etc. The laboratory periods are devoted to a study of the more important species, their identification, biology and specific control measures. Field work supplements laboratory study if time permits. One entire Saturday for field excursion also required.

1 class hour. 3 2-hour laboratory or field periods, 1 study hour, credit, 8.

Assistant Professor ALEXANDER.

Prerequisites, Entomology 26 or 28; 52 and 53 desirable.

76. **I. ADVANCED ENTOMOLOGY.** — For seniors. Studies on insect bionomics; scale insects, their structure, habits, methods of mounting, identification, etc.; studies of the animals not insects with which entomologists are expected to deal.
2 class hours.

3 2-hour laboratory periods, 3 study hours, credit, 11.

Professors CRAMPTON and ALEXANDER.

Prerequisite, Entomology 55.

77. **II. ADVANCED ENTOMOLOGY.** — Studies of the life history, habits and methods of control of the important insect pests of the United States; recognition tests of these pests and an examination of the literature on them; methods of bulletin preparation.

3 2-hour laboratory periods, 6 study hours, credit, 12.

Assistant Professor ALEXANDER.

Prerequisite, Entomology 76.

78. **III. ADVANCED ENTOMOLOGY.** — Classification of insects and of their early stages; principles of classification, the use of literature on entomology and the preparation of bibliographies and indices; the enemies of insects.

1 class hour. 3 2-hour laboratory or field periods, 2 study hours, credit, 9.

Professors FERNALD, CRAMPTON and ALEXANDER.

Prerequisite, Entomology 77.

90. **II. EVOLUTION.** — For juniors; seniors may elect. In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the developmental history of man, and of the races of mankind; the evolution of human intelligence, languages, culture, institutions, etc., and man's probable future in the light of his past development. Especial consid-

eration is given to the factors of evolution, the basic principles of heredity, variation and similar topics, with particular reference to their application to human welfare; and the recent contributions in the field of entomology to the advancement of our knowledge of these fundamental principles are briefly reviewed.

3 class hours.

4 study hours, credit, 7.

Professor CRAMPTON.

Courses in Beekeeping.

65. **III. INTRODUCTORY BEEKEEPING.** — For juniors. A detailed study of the normal behavior of the honey bee and the colony as a whole, followed by a study of such practical work of the apiary as is carried on in spring and summer. In so far as possible the laboratory work parallels the lecture work, and both are made to follow the seasonal processes of the colony. Spring management, swarm control and the production and care of the honey crop are covered thoroughly. The course is designed to meet the needs of the horticulturist as well as those of the honey producer, and should be followed by Course 85, I.

1 class hour.

2 2-hour laboratory periods, 3 study hours, credit, 8.

Assistant Professor CASSIDY.

85. **I. INTRODUCTORY BEEKEEPING.** — For seniors. A continuation of Course 65 and a completion of the beekeeping year. Fall management, preparation for winter and wintering are studied in detail in lectures and laboratory work. Original problems for student solution. It is highly advisable for those taking Course 65 to take Course 85, and thus complete the annual cycle of beekeeping activity.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.

Assistant Professor CASSIDY.

86. **III. ADVANCED BEEKEEPING.** — For seniors. A study of the special problems with which the beekeeper deals. The diagnosis and control of the various bee diseases, production of wax, sources of nectar, honey, bee anatomy and physiology, and marketing of the crop are some of the principal topics discussed. The course is designed for those who intend going into honey production either as a principal occupation or as a side line. Field trips to commercial apiaries; laboratory practice in queen rearing.

2 class hours.

1 2-hour laboratory period, 4 study hours, credit, 8.

Assistant Professor CASSIDY.

Mathematics and Civil Engineering.

Professor OSTRANDER, Professor MACHMER, Assistant Professor MOORE, Mr. PORTER.

The work of the freshman year is required. It is intended to furnish the necessary drill and groundwork needed for many of the scientific and practical courses of other departments. Thoroughness and accuracy are insisted upon. The advanced work in mathematics is taught from a practical standpoint, and many of its applications to other subjects are given. The courses in surveying and civil engineering are given to furnish the groundwork for a professional career. Special emphasis is given to the subjects bearing on highway construction and maintenance.

For drawing, a room on the north side is used for the draughting. It has draughting tables, T squares, scales, etc., for twenty students. Vernier protractors, parallel rules and steel T squares are available for precise work. A small room is devoted to blue printing.

In surveying, the department has a considerable number of chains and tapes, two railroad compasses, a builder's level, two dumpy levels, two Y levels and two old levels used for teaching the adjustments. Six transits are available for student use. Two are provided with solar attachments. An omnimeter with vernier reading to ten seconds is available for geodetic work. A hand level, mining aneroid barometer, and prismatic compass are provided for reconnaissance work. A set of Gilmor's needles and a Fairbanks' machine are used for cement testing.

Required Courses.

1. **I. HIGHER ALGEBRA.** — For freshmen. A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, undetermined coefficients, summation of series, variation, continued fractions, determinants, permutations and combinations, logarithms, theory of equations. Reitz and Crathorne's "College Algebra."

4 class hours, 6 study hours.

Credit, 10.

Professors MACHMER, MOORE and Mr. PORTER.

2. **II. HIGHER ALGEBRA.** — As stated under Course 1. Required of all who present solid geometry for entrance.

3 class hours, 4 study hours.

Credit, 7.

Professors MACHMER, MOORE and Mr. PORTER.

3. **II. SOLID GEOMETRY.** — For freshmen. Theorems and exercises on the properties of straight lines and planes, dihedral and polyhedral angles, prisms, pyramids and regular solids; cylinders, cones and spheres; spherical triangles and the measurement of surfaces and solids. Wentworth and Smith's "Solid Geometry." Required unless accepted for admission.

3 class hours, 4 study hours.

Credit, 7.

Professors MACHMER, MOORE and Mr. PORTER.

4. **II. MENSURATION AND COMPUTATION.** — For freshmen. A review of methods of computation, with special emphasis on short and abbreviated processes, together with methods of checking computations and of forming close approximations; use of slide rule. Also the graph, mensuration of plane and solid figures, weights and measures and elementary mechanism. Numerous practical problems are selected from such subjects as the following: the mathematics of woodworking; rough lumber; general construction; forestry methods in heights of trees; pulleys, belts and speeds; power and its transmission; dairying; agronomy; computation of areas from simple measurements.

2 class hours, 3 study hours.

Credit, 5.

Professor MACHMER and Mr. PORTER.

5. **III. PLANE TRIGONOMETRY.** — For freshmen. The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications. Bowser's "Elements of Plane and Spherical Trigonometry."

3 class hours, 6 study hours.

Credit, 9.

Professors MACHMER, MOORE and Mr. PORTER.

Elective Courses.

26. **II. PLANE SURVEYING.** — For sophomores; juniors and seniors may elect. The elements of the subject, including the adjustment and use of the usual instruments. Textbook and lectures.

3 class hours, 6 study hours.

Credit, 9.

Professors OSTRANDER and MOORE.

27. **III. PLANE SURVEYING.** — For sophomores; juniors and seniors may elect. As stated under Course 26. Includes field work.

3 2-hour laboratory periods, 4 study hours, credit, 10.

Professors OSTRANDER and MOORE.

Prerequisite, Mathematics 26.

50. **I. ANALYTIC GEOMETRY.** — For juniors; seniors may elect. A discussion of the geometry of the line, the circle, conic sections, and the higher plane curves. Fine and Thompson's "Co-ordinate Geometry."

3 class hours.

6 study hours, credit, 9.
Professor MACHMER.

Prerequisites, Mathematics 1, 2, 3 and 5.

51. **II. DIFFERENTIAL AND INTEGRAL CALCULUS.** — For juniors; seniors may elect. A first course in the subject, with some of the more important applications. Granville's "Differential and Integral Calculus."

5 class hours.

10 study hours, credit, 15.
Assistant Professor MOORE.

Prerequisites, Mathematics 1, 2, 3 and 5.

52. **III. INTEGRAL CALCULUS.** — For juniors; seniors may elect. A continuation of Course 51.

5 class hours.

10 study hours, credit, 15.
Assistant Professor MOORE.

Prerequisite, Mathematics 51.

53. **II. ELEMENTARY STRUCTURES.** — For juniors; seniors may elect. An elementary course in roofs and bridges. Textbook and lectures.

3 class hours.

1 2-hour laboratory period, 6 study hours, credit, 11.
Professor OSTRANDER.

75. **I. HYDRAULICS AND SANITARY ENGINEERING.** — For seniors; juniors may elect. Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Textbook and lectures.

5 class hours.

10 study hours, credit, 15.
Professor OSTRANDER.

76. **I. MATERIALS OF CONSTRUCTION. FOUNDATIONS AND MASONRY CONSTRUCTION.** — For seniors; juniors may elect. Textbook and lectures.

5 class hours.

10 study hours, credit, 15.
Professor OSTRANDER.

77. **II. ROADS AND RAILROADS.** — For seniors; juniors may elect. Topographic and higher surveying, highway construction, earthwork, pavements and railroad construction. Textbook and lectures.

3 class hours.

6 study hours, credit, 9.
Professor OSTRANDER.

78. **III. ROADS AND RAILROADS.** — For seniors; juniors may elect. As stated under Course 77.

3 2-hour laboratory periods, credit, 6.
Professor OSTRANDER.

Prerequisite, Mathematics 77.

Microbiology.

Professor MARSHALL, Assistant Professor WERKMAN, Dr. NELSON, Miss GARVEY.

Three objectives are sought in the arrangement of the courses following: (1) Introductory courses (50 and 51) needed in the general training of every college student. (2) An introductory course followed by a specific course (as 80, 81, 82, 83), necessary to every student engaged in the Division of Agriculture, with which the specific course deals. (3) Introductory courses (50 and 51) followed by Courses 52, 75, 76 and 81, preparatory for students who are aiming to specialize in agricultural microbiology. (Courses 75, 76 and 81 are adapted to those having Courses 50 and 51 only, and are also adapted to those majoring in microbiology.)

The microbiological work is carried on in a building especially designed for it.

There are 4 class laboratory rooms, 8 private laboratory rooms, 1 lecture room, 5 incubator rooms, 3 sterilizing rooms, 3 hood rooms, 3 washing rooms, 3 inoculating rooms, 3 weighing rooms, an animal room, a photographic and dark room, a sub-basement refrigerator room, a library and 4 office rooms.

The class laboratory rooms are so arranged that individual desks are available for student use. Hot and cold water and gas connections are convenient for each desk; high-pressure steam and electric connections are also available. The building is well lighted and of sanitary construction; all the walls are of brick, and the building is fireproof.

The library is equipped with such books and current periodicals as are useful in the conduct of bacteriological work and investigations. Twenty-four scientific magazines are available regularly.

There are incubators, both electric and gas, hot-air sterilizers, ordinary steam sterilizers, autoclaves, an inspissator, blood-testing apparatus, vacuum apparatus, air-pressure apparatus, shaker, grinder, centrifugal machines, a water still of 5 gallons per hour capacity, Hoskins' combustion furnace, a balopticon, complete microphotographic equipment, microscopes, microtome, and such other apparatus, glassware and chemicals as are needed for extensive and intensive work.

Required Course.

30. **III. ELEMENTARY MICROBIOLOGY.** — Required of sophomores majoring in the agricultural division. Designed to make micro-organisms real and significant to the student who seeks some knowledge of their activities. An attempt is made to place them among living organisms, to demonstrate their wide distribution in nature and to indicate what they do. Some of the essential methods of control and propagation are reviewed. Owing to the time limit, this course may be regarded as an introductory survey course only.

6 laboratory hours, credit, 6.

Elective Courses.

50. **I, II and III. INTRODUCTORY AND GENERAL MICROBIOLOGY.** — For juniors; seniors may elect. Aims to provide elementary basis for microbial studies and interpretation, to enable students to pursue special pertinent courses which will serve as supports in practical electives or majors, and to furnish students with such material as will be valuable in understanding public health problems.

2 class hours. 3 2-hour laboratory periods, 2 study hours, credit, 10.

Professor MARSHALL and ———.

51. **II and III. MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.** — For juniors; seniors may elect. Types of micro-organisms, technic of handling, methods of culture and functions of micro-organisms are considered. This course is fundamental to all advanced and extended microbiological studies.

1 class hour. 6 laboratory hours, 3 study hours, credit, 10.

Prerequisite, Microbiology 30 or 50.

52. **III. ADVANCED MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.** — For juniors; seniors may elect. Prepares for a more intimate knowledge of microbiological agricultural problems. To accomplish this object it is necessary to provide more advanced technique and methods of culture, together with a more extensive knowledge of micro-organisms and their functions.

1 class hour. 5 laboratory hours, 4 study hours, credit, 10.

Prerequisite, Microbiology 51.

60. **I. PUBLIC HEALTH.** — For juniors; seniors may elect. Considers the relation of the human body to its environment in the maintenance of health and the production of disease. This study is based upon human anatomy and physi-

ology. The individual, as a member of society, governed by natural laws, is also of fundamental importance. A knowledge and an interpretation are sought of the usual agencies connected with health and disease, as air, water, sewage, dairy products, foods, drugs, carriers, vaccines and their prophylactic means, biological products as diagnostic and remedial materials and public health practices now recognized. Diseases of public health significance are reviewed, their control considered and their social values discussed.

3 class hours, 6 study hours.

Credit, 9.

Professor MARSHALL and Miss GARVEY.

61. **II. PUBLIC HEALTH.** — For juniors; seniors may elect. As stated under Course 60.

3 class hours, 6 study hours.

Credit, 9.

Professor MARSHALL and Miss GARVEY.

62. **III. PUBLIC HEALTH.** — For juniors; seniors may elect. As stated under Course 60.

3 class hours, 6 study hours.

Credit, 9.

Professor MARSHALL and Miss GARVEY.

75. **II. AGRICULTURAL MICROBIOLOGY.** — For seniors; juniors may elect. This general comprehensive course is designed to cover in an elementary manner those subjects only which confront the student of general agriculture, — the microbiological features of air, water, sewage, soil, dairy, fermentations, food, vaccines, antisera, microbial plant infections, methods and channels of infections, immunity and susceptibility, microbial infections of man and animals, methods of control or sanitary and hygienic practices.

1 class hour.

5 laboratory hours, 4 study hours, credit, 10.

Prerequisite, Microbiology 51.

76. **III. AGRICULTURAL MICROBIOLOGY.** — For seniors; juniors may elect. As stated under Course 75.

1 class hour.

5 laboratory hours, 4 study hours, credit, 10.

Prerequisite, Microbiology 75.

80. **II. SOIL MICROBIOLOGY.** — For seniors; juniors may elect. Such subjects as the number and development of micro-organisms in different soils; the factors which influence their growth, food, reaction, temperature, moisture and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention.

1 class hour.

5 laboratory hours, 4 study hours, credit, 10.

Prerequisite, Microbiology 51.

81. **I. HYGIENIC MICROBIOLOGY.** — For seniors; juniors may elect. An attempt is made to select certain material which is basic to public hygiene and sanitation, as applied to man and animals. The microbiology of water supplies, food supplies, vaccines, antisera or antitoxins; the channels by which micro-organisms enter the body, the influence of body fluids and tissues upon them, body reactions with micro-organisms (susceptibility and immunity); the micro-organisms of some of the most important infectious diseases, methods of control, including disinfectants and disinfection, antiseptics, antisepsis and asepsis, are treated.

1 class hour.

5 laboratory hours, 4 study hours, credit, 10.

Prerequisite, Microbiology 51.

82. **I. DAIRY MICROBIOLOGY.** — For seniors; juniors may elect. Special emphasis is placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of straining, aeration, clarification, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bacterial content of butter; a passing survey of the microbiology of cheeses; a study of special dairy products, as ice cream, condensed milk, artificial milk drinks (the products of microbial actions), represents a list of topics considered.

1 class hour.

5 laboratory hours, 4 study hours, credit, 10.

Professor MARSHALL and Miss GARVEY.

Prerequisite, Microbiology 51.

83. **III. FOOD MICROBIOLOGY.** — For seniors; juniors may elect. A study of the principles of food preservation, and food preservation by means of drying, canning, refrigerating and addition of chemicals, is pursued. Food fermentations, as illustrated by bread, pickles, sauerkraut, ensilage, vinegar, wine, etc., are examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased and poisonous foods, receive consideration. Contamination of food supplies by means of water, sewage, handling, exposure, diseased persons, etc., is of especial significance, and is demonstrated by laboratory exercises. Laboratory inspection of foods is now a subject of great import and is given attention.

1 class hour.

5 laboratory hours, 4 study hours, credit, 10.

Professor MARSHALL and Miss GARVEY.

Prerequisite, Microbiology 51.

Physics.

Professor —, Professor —, Mr. ALDERMAN.

The fundamental and basic importance of the laws and phenomena of physics makes necessary no explanation of the introduction of this subject into the curriculum of an agricultural college. The logical development of the subject emphasizes the importance of physics as a science in itself. Special emphasis is laid, however, on the correlation of the principles studied with the sciences of agriculture, botany, chemistry and zoölogy, thus furnishing an extra tool by use of which the student's work in all the subjects may be more effective.

In Courses 25, 26 and 27 the subject-matter is presented with the idea of its special application primarily in the work in agriculture and general science. The full year's work is required of all students continuing work specifically in the Division of Science. Course 25 is required of all students. The subject-matter is especially selected and arranged for its practical application rather than its theoretical development. Courses 50, 51 and 52 are advised for students in chemistry, general biology, microbiology and general science. The subject-matter is selected, and the courses developed, with the idea of making the student proficient in laboratory manipulation. Sufficient theory is given in connection with the work to enable the student to apply the knowledge and practice thus gained in the department indicated above.

The department has at its command a building on the east campus, containing a general lecture room and laboratory for sophomore work, a laboratory for junior work, and in the basement one small laboratory for quantitative work in light measurement. There is also in the basement a fairly well-equipped shop for the repair and construction of apparatus used in the department work. The usual apparatus for the demonstration in the lecture room is in the possession of the department.

Required Courses.

25. **I. GENERAL PHYSICS.** — For sophomores. Mechanics of solids and fluids. This course includes statics, with equilibrium of rigid bodies, work, energy and friction; kinetics, considering rectilinear motion and motion in a curved path;

The department occupies a modern laboratory and hospital stable, built in accordance with the latest principles of sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation and disinfection.

The main building contains a large working laboratory for student use, and several small private laboratories for special work. There is a lecture hall, a museum, a demonstration room, a photographing room and a workshop. The hospital stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a poultry section, a section for cats and dogs, and 6 sections, separated from each other, for horses, cattle, sheep and swine. The laboratory equipment consists of a dissectible Auzoux model of the horse and Auzoux models of the foot and the leg, showing the anatomy and the diseases of every part. The laboratories also have modern, high-power microscopes, microtomes, incubators and sterilizers, for work in every department of veterinary science, including pathology, serology and parasitology. There are skeletons of the horse, the cow, the sheep, the dog and the pig, and a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts and diagrams.

Elective Courses.

50. **II. VETERINARY HYGIENE AND STABLE SANITATION.** — For juniors; seniors may elect. Familiarizes students with the relation of water, food, air, light, ventilation, care of stables, disposal of excrement, individual hygiene, etc., to the prevention of disease in farm animals.
5 class hours.

3 study hours, credit, 8.
Assistant Professor LENTZ.

53. **I. GROSS VETERINARY ANATOMY.** — For juniors; seniors and graduate students may elect. The detailed study of the skeleton is followed by dissection of the muscular system and the study of joints. Not offered in 1924-25.

2 3-hour laboratory periods, 2 study hours, credit, 8.
The DEPARTMENT.

54. **II. GROSS VETERINARY ANATOMY.** — For juniors; seniors and graduate students may elect. The continuation of Veterinary 53, consisting of dissection and study of the circulatory, nervous, digestive, respiratory, and genito-urinary systems. Not offered in 1924-25.

2 3-hour laboratory periods, 2 study hours, credit, 8.
The DEPARTMENT.

Prerequisite, Veterinary 53.

75. **I. COMPARATIVE (VETERINARY) ANATOMY.** — For seniors; juniors may elect. The anatomy of the horse is studied in detail, and that of other farm animals, particularly the ox. This course is essential for those students wishing to elect Course 77. It is a lecture and demonstrational course and open to all students interested. It is not a course in dissection anatomy.
5 class hours.

3 study hours, credit, 8.
Assistant Professor LENTZ.

76. **II. GENERAL VETERINARY PATHOLOGY.** — For seniors; juniors may elect. Fundamental, general, pathological conditions, as for example, inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in prevention, diagnosis, and treatment of disease, are studied. The course in pathology is followed by a brief consideration of materia medica, therapeutic measures, and poisonous plants.
5 class hours.

3 study hours, credit, 8.
Assistant Professor LENTZ.

77. **III. APPLIED GENERAL PATHOLOGY.** — For seniors; juniors may elect. This course is a continuation of Course 76. Particular attention is given to the etiology, the pathogenesis and the prophylaxis of the communicable and non-communicable diseases of the different species of domesticated animals. Lectures and demonstrations.
5 class hours.

3 study hours, credit, 8.
Assistant Professor LENTZ.

Prerequisites, Veterinary 75 or Veterinary 78, 79 and 80.

78. **I. ESSENTIALS OF GENERAL PATHOLOGY.** — For seniors; juniors may elect. Introduces students to some of the essential anatomical, histological and general physiological phenomena essential to the understanding of some of the simple general pathological conditions found in domestic animals. Some of the common methods of diagnosis are considered in the laboratory. The various chemical and biological reactions and tests are presented from the standpoint of pure science, showing applications of chemistry and biology. The course serves to educate liberally and stimulate in the student of agriculture the appreciation of some of the methods used in animal pathology for detecting and controlling some of the more common animal diseases. Lectures, demonstration and laboratory work.

2 3-hour laboratory periods, 2 study hours, credit, 8.
Professor GAGE.

79. **II. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.** — For seniors; juniors may elect. A continuation of Course 78, devoted to a study of some of the common pathological conditions by means of prepared sections, the aim being to demonstrate to the student abnormal animal histological structures commonly observed when material from various cases of animal diseases is prepared for microscopical study. Some of the biological products used in protecting animals against disease are considered.

2 3-hour laboratory periods, 2 study hours, credit, 8.
Professor GAGE.

Prerequisite, Veterinary 78.

80. **III. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.** — For seniors; juniors may elect. As stated in Courses 78 and 79.

2 3-hour laboratory periods, 2 study hours, credit, 8.
Professor GAGE.

Prerequisite, Veterinary 79.

85. **I. AVIAN PATHOLOGY.** — For seniors; juniors may elect. A course in poultry diseases. The object is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. Consists of a systematic study of the diseases of the alimentary tract, liver and abdominal region, followed by a study of the diseases of the respiratory system, circulation and kidneys. The important disease-producing external and internal parasites are considered; also diseases of the skin and reproductive organs. Lectures and demonstrations.

2 3-hour laboratory periods, 2 study hours, credit, 8.
Assistant Professor PYLE.

86. **II. AVIAN PATHOLOGY.** — For seniors; juniors may elect. As stated under Course 85, also devoted to the study of some of the special diseases of poultry. Recent methods used in the control of these diseases are considered an opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations and laboratory work.

2 3-hour laboratory periods, 2 study hours, credit, 8.
Assistant Professor PYLE.

Prerequisite, Veterinary 85.

87. **III. AVIAN PATHOLOGY.** — For seniors; juniors may elect. As stated under Courses 85 and 86.

2 3-hour laboratory periods, 2 study hours, credit, 8.
Assistant Professor PYLE.

Prerequisite, Veterinary 86.

Zoölogy and Geology.

Professor GORDON, Mr. RING.

I

The facts and principles of the sciences of zoölogy and geology have important applications in industry and the arts, and with those of their sister sciences form a body of knowledge of value and interest with which the educated man finds it necessary to gain a close familiarity. The elective courses in this department stand as offerings to students who wish to supplement their work in other departments, or who, for any reason, wish to enlarge their knowledge in either zoölogy or geology. Students are encouraged to consult the department about any courses which may be available to them, and which might prove necessary or helpful for any line of work they may wish to follow.

The building occupied jointly by the department of entomology and the department of zoölogy and geology has for the work in zoölogy and geology laboratories equipped with gas, compound microscopes and the accessories needed for study in these subjects. The Zoölogical Museum has a representative collection of several thousand specimens of animals, and is drawn upon for material illustrating the various courses.

ZOÖLOGY.

Required Course.

26. **II. GENERAL PRINCIPLES OF ZOÖLOGY.** — For sophomores. An introductory course dealing with the basic features of animal structure, functions of organs, relations of animals to each other and some of the important principles and doctrines that have grown out of the study of animals.

2 class hours.

2 2-hour laboratory periods, 3 study hours, credit, 9.
The DEPARTMENT.

Elective Courses.

50. **I. SYNOPSIS INVERTEBRATE ZOÖLOGY; THE ANNELIDS AND THE ARTHROPODS.** — For juniors; seniors may elect. A study of the classes and orders of the annelid worms and the arthropods, exclusive of insects.

1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

51. **II. SYNOPSIS INVERTEBRATE ZOÖLOGY; THE MOLLUSCS AND THE ECHINODERMS.** — For juniors; seniors may elect. A study of the classes and orders of the molluscs and echinoderms.

1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26:

52. **III. SYNOPSIS INVERTEBRATE ZOÖLOGY; MISCELLANEOUS INVERTEBRATE PHYLA.** — For juniors; seniors may elect. A study of various selected phyla of the non-vertebrated animals. For those who have not taken either or both of the preceding courses in synoptic invertebrate zoölogy this course may include representatives of the different phyla named therein.

1 class hour.

2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

53. **I. ELEMENTS OF MICROSCOPIC TECHNIQUE.** — For juniors; seniors may elect. Gives the usual methods of preparing material for microscopic examination, including fixing, embedding, sectioning and differentiation by stains. May be supplemented by a study of selected normal tissues in connection with their physiological properties.

3 2-hour laboratory periods, credit, 6.
The DEPARTMENT.

75. **I. SPECIAL ZOÖLOGY.** — Juniors, seniors and graduates may apply for such special work as they are qualified to undertake.

1 class hour. 2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

76. **II. SPECIAL ZOÖLOGY.** — Same as Course 75.

1 class hour. 2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

77. **III. SPECIAL ZOÖLOGY.** — Same as Course 75.

1 class hour. 2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

79. **III. ORNITHOLOGY.** — For juniors; seniors may elect. The taxonomic characters, distribution and habits of birds.

1 class hour. 2 2-hour laboratory periods, 2 study hours, credit, 7.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

GEOLOGY.

52. **III. GENERAL GEOLOGY.** — For juniors; seniors may elect. A course in the various aspects of physical geology, dealing with materials of the earth's crust; their nature, origin and arrangement and the changes which they undergo.

2 class hours. 3 2-hour laboratory periods, 2 study hours, credit, 10.
Professor GORDON.

DIVISION OF THE HUMANITIES.

Professor LEWIS.

Economics and Sociology.

Professor LEWIS, Professor SIMS,¹ Professor MACKIMMIE.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

The courses in economics and sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.

Required Course.

25. **I. INTRODUCTION TO ECONOMIC PRINCIPLES AND PROBLEMS.** — For description of course see Course 50, **I.**

3 class hours, 6 study hours.

Credit, 9.
Professor MACKIMMIE.

¹ Absent on leave.

Elective Courses.

26. **II. CIVILIZATIONS, ANCIENT AND MODERN.** — For sophomores; others may elect. The evolutionary origin and history of man; characteristics of primitive man, departure from the animal status and beginnings of civilization; origin and development of industries, arts and sciences; the evolution of languages, warfare, migrations and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern development; characteristic features of the leading civilizations and races of ancient and modern times; beneficial and dangerous factors in American life in view of the history of human civilization. Not given 1924-25.
5 class hours.

50. **I. INTRODUCTION TO ECONOMIC PRINCIPLES AND PROBLEMS.** — For juniors. Definitions of economic terms, such as wealth, capital, value, etc.; factors of production, exchange and consumption; principles of economic production, supply and demand, diminishing returns, division of labor, productive organization, concentration of capital and labor, trust and monopoly problems, public control of production and distribution; principles of exchange, theories of value, money and its problems; international trade, tariff and free trade theories, American merchant marine, reciprocity, and trade treaties; forms of income, wages, interest, rent, profits and the forces which govern them; principles of spending, economy, luxury, conservation of individual and national resources; principles and agencies for saving, investments, banks, building associations, insurance of all kinds; schemes for social organization; socialism, communism, industrial democracy. Textbook and readings.
5 class hours, 10 study hours.

Credit, 15.

Professor MACKIMMIE.

51. **II. BUSINESS AND INDUSTRY.** — For juniors and seniors. The forms, organization, administration and labor problems of business. Methods of organizing, financing and administering corporations and partnerships; forms of business administration, wholesaling, jobbing, retailing, advertising, credits and collections; system of industrial remuneration for wage earners, co-operation and preserving industrial peace; problems concerned with protective legislation for workmen and employers, sweated industries, prison labor, child labor and industrial education.
5 class hours, 7 study hours.

Credit, 12.

Professor MACKIMMIE.

52. **III. PUBLIC FINANCE, TAXATION, MONEY AND BANKING.** — For seniors. Systems and problems of taxation as they are found in Europe and America; objects for spending public revenue; public debts and methods of organizing them; systems of money and currency problems of America; types, methods and functions of banks; economic and financial crises and depressions in the United States; modern war finance. Readings and lectures.
5 class hours, 7 study hours.

Credit, 12.

Professor MACKIMMIE.

75. **I. SOCIAL INSTITUTIONS AND SOCIAL REFORMS.** — For seniors; juniors by permission. Social institutions, such as the family, the State, property, religions; and such current problems as eugenics, race suicide, divorce, crime and delinquent classes, prison reform, prevention and treatment of dependents and defectives, poverty, its causes and preventions; constructive modern social reform movements for insurance of wage earners, protection of childhood, assurance of safety, health and play time for all classes. The correctional and charitable institutions of Massachusetts are studied in considerable detail.
5 class hours, 10 study hours.

Credit, 15.

Professor SIMS.

History and Government.

Professor LEWIS, Professor MACKIMMIE.

Required Courses.

25. **II. AMERICAN GOVERNMENT.** — A study of the structure and operation of the machinery of our government; also a study of the history of its development from its inception to the present day.

3 class hours, 5 study hours.

Credit, 8.

Professor LEWIS.

27. **III. CITIZENSHIP.** — A course designed to acquaint the student with the most important and immediate problems of government — national, state and local — so that as a citizen he may make an intelligent contribution towards their solution. Lectures and discussions.

2 class hours, 4 study hours.

Credit, 6.

Professor LEWIS.

Elective Courses.

50. **I. GOVERNMENT.** — For juniors; seniors may elect. Forms and working methods of the government of Great Britain, Germany, France, Russia, Switzerland, New Zealand and Canada; historic types and theories of government; forms and methods of Federal, State and local governments in America; progress and problems of democracy and new reform movements in organization and administration; new tendencies towards social legislation and extension of governmental control.

3 class hours, 6 study hours.

Credit, 9.

Professor LEWIS.

51. **II. MODERN EUROPEAN HISTORY.** — For juniors; seniors may elect. The modern history of the principal countries of Europe, especially the great movements and revolutions that developed the nations up to the present generation.

3 class hours, 6 study hours.

Credit, 9.

Professor MACKIMMIE.

52. **III. EUROPEAN HISTORY SINCE 1870.** — For seniors; juniors may elect. The Franco-Prussian War and the formation of the German Empire, the unification of Italy, the Third French Republic, European Expansion in the East, the Russo-Japanese War, and the origin, events and probable results of the War of 1914. While a continuation of Course 51, this course will be complete in itself, and may be elected by those who have had no history training. Its aim is to provide the basis for an understanding of present-day conditions, and for an intelligent participation in world affairs.

3 class hours, 6 study hours.

Credit, 9.

Professor MACKIMMIE.

Languages and Literature.

Professor LEWIS, Professor PATTERSON, Professor MACKIMMIE, Professor ASHLEY, Assistant Professor PRINCE, Assistant Professor JULIAN, Assistant Professor RAND, Miss GOESSMANN, Mr. JACKSON, Mr. HALLIDAY.

ENGLISH.

Required Courses.

1. **I. 2. II. 3. III. ENGLISH.** — For freshmen. Composition. Intended to teach straight thinking, sound structure, clear and correct expression. Lectures, recitations, theme writing and conferences.

3 class hours, 5 study hours.

Credit, 8, **I, II** terms.

3 class hours, 6 study hours.

Credit, 9, **III** term.

Professors PATTERSON, PRINCE, RAND and Mr. JACKSON.

25. **I.** 26. **II.** 27. **III.** ENGLISH. — For sophomores. A general reading course in English literature.
2 class hours, 4 study hours.

Credit, 6.

Professor PATTERSON and Miss GOESSMANN.

28. **I.** 29. **II.** 30. **III.** ENGLISH. — English composition, oral and written.
1 class hour, 2 study hours.

Credit, 3.

Professors PATTERSON, PRINCE, RAND and Mr. JACKSON.

Elective Courses in English Language and Literature.

50. **I.** ENGLISH POETRY OF THE ROMANTIC PERIOD (1925-26). — Alternates with Course 53. For juniors; seniors may elect. A course in history, appreciation and understanding. Some of the writers studied are Gray, Goldsmith, Burns, Scott, Wordsworth, Coleridge, Byron, Keats and Shelley.
3 class hours, 6 study hours.

Credit, 9.

Professor PATTERSON.

51. **II.** ENGLISH POETRY IN THE NINETEENTH CENTURY (1924-25). — Alternates with Course 54. For juniors; seniors may elect. In general, this course is like Course 50. Tennyson, Browning, Mrs. Browning, Arnold, Clough, the Rossettis, Morris, Swinburne and others.
3 class hours, 6 study hours.

Credit, 9.

Professor LEWIS.

57. **III.** ENGLISH POETRY IN THE NINETEENTH CENTURY (1924-25). — Alternates with Course 58. For juniors; seniors may elect. As stated under Course 51.
3 class hours, 6 study hours.

Credit, 9.

Professor LEWIS.

52. **III.** ENGLISH WRITERS FROM MILTON TO POPE. — For juniors; seniors may elect. A survey course that emphasizes the leading writers, literary currents and the thought of the period. Some of the writers studied are Milton, Dryden, Addison, Swift and Pope.
3 class hours, 6 study hours.

Credit, 9.

Professor PATTERSON.

53. **I.** ENGLISH PROSE OF THE ROMANTIC PERIOD (1924-25). — For juniors; seniors may elect. A course in English prose paralleling Course 50. Some of the writers studied are Goldsmith, Coleridge, Lamb, DeQuincey and Hazlitt.
3 class hours, 6 study hours.

Credit, 9.

Professor PATTERSON.

54. **II.** ENGLISH PROSE IN THE NINETEENTH CENTURY (1925-26). — For juniors; seniors may elect. Parallels Course 51. Among the writers considered will be Macaulay, Carlyle, Ruskin, Newman and Arnold.
3 class hours, 6 study hours.

Credit, 9.

Professor LEWIS.

58. **III.** ENGLISH PROSE IN THE NINETEENTH CENTURY (1925-26). — For juniors; seniors may elect. As stated under Course 54. Alternates with Course 57.
3 class hours, 6 study hours.

Credit, 9.

Professor LEWIS.

55. **II.** AMERICAN LITERATURE. — For juniors; seniors may elect. A course in the chief American prose writers; among those studied being Franklin, Brockden, Brown, Irving, Cooper, Poe, Hawthorne, Emerson, Thoreau, Lowell, Holmes, Parkman.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor PRINCE.

56. **III. AMERICAN LITERATURE.** — For juniors; seniors may elect. A course in the chief American poets; among those studied being Freneau, Bryant, Poe, Emerson, Longfellow, Whittier, Holmes, Lowell, Whitman, Lanier.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor PRINCE.

60. **I. THE LITERATURE OF RURAL LIFE.** — For juniors; seniors may elect. A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horticulture and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities.

3 class hours, 3 study hours.

Credit, 6.

Miss GOESSMANN.

61. **II. THE LITERATURE OF RURAL LIFE.** — For juniors; seniors may elect. As stated under Course 60.

3 class hours, 3 study hours.

Credit, 6.

Miss GOESSMANN.

Prerequisite, English 60.

65. **I. ADVANCED COMPOSITION.** — For juniors; seniors may elect. Advanced work in expository writing, based upon specimens by contemporary authors and upon the personal experience of the student. Particular attention is given to organization, diction and style.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor RAND.

66. **II. ADVANCED COMPOSITION.** — For juniors; seniors may elect. The preparation of theses and similar manuscripts upon subjects selected by the student. The foundation of this course lies in an orderly accumulation of material followed by an intelligent and readable interpretation of its significance.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor RAND.

67. **III. ADVANCED COMPOSITION.** — For juniors; seniors may elect. Work in journalistic and fictional narrative with supplementary reading.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor RAND.

75. **III. PROSE FICTION.** — The short story or the novel. For seniors; juniors may elect. Readings, reports and discussions. Not offered in 1924-25.

3 class hours or library equivalents.

79. **II. SHAKESPEARE.** — For seniors; juniors may elect. A cursory survey of the origin and rise of English drama is followed by the reading of about fifteen of Shakespeare's plays, selected to indicate the evolution of the dramatist and to emphasize the various phases of his art. Every attempt is made to deepen the student's appreciation of the personalities to be found in the plays, and of the beauty of the many memorable poetic passages.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor RAND.

80. **III. MODERN DRAMA.** — For seniors; juniors may elect. This course traces the development of English drama from the time of the Restoration to the present day. The purpose of the course is to impart an intelligent and sympathetic interest in the theatre of the Twentieth Century.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor RAND.

PUBLIC SPEAKING.

Elective Courses.

50. **I. ARGUMENTATION.** — For juniors; seniors may elect. Presents the fundamental principles of argumentation as applied to oral and written discourse, and develops in the student power to handle argument convincingly and persuasively. Lectures, discussions of leading questions of the day, practice in briefing and the writing of forensics. The course is recommended for those who desire to enter the intercollegiate debates.
3 class hours, 6 study hours.

Credit, 9.

Assistant Professor PRINCE.

51. **II. OCCASIONAL ORATORY.** — For juniors; seniors may elect. A study of the principles and the practice of formal oratory; the preparation and delivery of one original oration; prescribed reading in oratory. The course is recommended for those who wish to enter the Flint Contest.
3 class hours, 6 study hours.

Credit, 9.

Assistant Professor PRINCE.

French and Spanish.

Professor MACKIMMIE, Professor ASHLEY, Mr. HALLIDAY.

The aim of the courses in French and Spanish is to give the student a practical knowledge of these languages for the purpose of wider reading and research, to introduce him to some of their treasures in art and science, and through the literature to acquaint him with the people. In the elementary courses as much time as possible is given to oral work, to develop a speaking, as well as a reading, knowledge of the tongue.

FRENCH.

Required Courses.

1. **I. 2. II. 3. III. ELEMENTARY FRENCH.** — For freshmen; open upon arrangement to other students. The essentials of grammar are rapidly taught and will be accompanied by as much reading as possible. Required of freshmen presenting German for entrance who do not continue that language and have not studied French.

3 class hours, 6 study hours.

Credit, 9, **I, III** terms.

3 class hours, 5 study hours.

Credit, 8, **II** term.

Mr. HALLIDAY.

4. **I. 5. II. 6. III. INTERMEDIATE FRENCH.** — For freshmen; open upon arrangement to other students. Training for rapid reading. The reading of a number of short stories, novels and plays; composition, reports on collateral reading from periodicals and scientific texts in the library.

3 class hours, 6 study hours.

Credit, 9, **I, III** terms.

3 class hours, 5 study hours.

Credit, 8, **II** term.

Professor ASHLEY and Mr. HALLIDAY.

Prerequisite, required of freshmen who present two years of French for entrance and do not take German.

Elective Courses.

25. **I. INTERMEDIATE FRENCH.** — For sophomores; open upon arrangement to other students. Training for rapid reading; the reading of a number of short stories, novels and plays; readings from periodicals and scientific texts in the library.

3 class hours, 5 study hours.

Credit, 8.

Mr. HALLIDAY.

Prerequisites, French 1, 2 and 3.

26. **II. INTERMEDIATE FRENCH.** — For sophomores; open upon arrangement to other students. As stated under Course 25.
3 class hours, 5 study hours.

Credit, 8.
Mr. HALLIDAY.

Prerequisite, French 25.

27. **III. INTERMEDIATE FRENCH.** — For sophomores; open upon arrangement to other students. As stated under Course 25.
3 class hours, 6 study hours.

Credit, 9.
Mr. HALLIDAY.

Prerequisite, French 26.

28. **I. ADVANCED FRENCH.** — For sophomores; open upon arrangement to other students. A reading course. Balzac's "Eugénie Brandet" and "Le Père Goriot," and other masterpieces of the nineteenth century; Brunetière's "Honoré de Balzac" and Harper's "Masters of French Literature," readings in the library and written reports.
3 class hours, 5 study hours.

Credit, 8.
Professor ASHLEY.

Prerequisites, French 4, 5 and 6.

29. **II. ADVANCED FRENCH.** — For sophomores; open upon arrangement to other students. As stated under Course 28.
3 class hours, 5 study hours.

Credit, 8.
Professor ASHLEY.

Prerequisites, French 4, 5 and 6.

30. **III. ADVANCED FRENCH.** — For sophomores; open upon arrangement to other students. General view of the history of French literature; Kastner and Atkins' "History of French Literature." Representative works of the important periods. Outside reading.
3 class hours, 6 study hours.

Credit, 9.
Professor ASHLEY.

Prerequisites, French 25 and 26, or French 28 and 29.

50. **I. SCIENTIFIC FRENCH.** — For juniors; seniors may elect. Meets the requirements of individual students and equips them with exact English equivalents for the French scientific terms in their particular science. Word lists of scientific terms are required, and also weekly readings and reports from scientific works in the subject in which they are majoring. Several scientific works are read.

3 class hours, 6 study hours.

Credit, 9.
Mr. HALLIDAY.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

51. **II. SCIENTIFIC FRENCH.** — For juniors; seniors may elect. As stated under Course 50.

3 class hours, 6 study hours.

Credit, 9.
Mr. HALLIDAY.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

52. **III. SCIENTIFIC FRENCH.** — For juniors; seniors may elect. As stated under Course 50.

3 class hours, 6 study hours.

Credit, 9.
Mr. HALLIDAY.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

75. **I. FRENCH LITERATURE.** — For seniors; juniors may elect. The object of Courses 75, 76 and 77 is to give an introduction to recent movements in French

literature. Course 75 deals with the drama, and plays by Augier, A. Dumas *filis*, Delavigne and other contemporary dramatists.
2 class hours, 4 study hours.

Credit, 6.

Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

76. **II. FRENCH LITERATURE.** — For seniors; juniors may elect. The novel. Works by Flaubert, the De Goncourts and Zola are read. Written reports are required on outside reading.

2 class hours, 4 study hours.

Credit, 6.

Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

77. **III. FRENCH LITERATURE.** — For seniors; juniors may elect. Modern criticism. Sainte-Beuve, "Causeries du Lundi" (Harper), and works by Taine and Renan. Reference book, Lanson's "Histoire de la Littérature Française."

2 class hours, 4 study hours.

Credit, 6.

Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

SPANISH.

Elective Courses.

50. **I. ELEMENTARY SPANISH.** — For juniors; seniors may elect. Open to other students upon arrangement. Grammar, with special drill in pronunciation; exercises in conversation and composition. Reading from a reader and selected short stories.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

51. **II. ELEMENTARY SPANISH.** — For juniors; open to other students upon arrangement. As stated in Course 50.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

Prerequisite, Spanish 50.

52. **III. ELEMENTARY SPANISH.** — For juniors; open to other students upon arrangement. As stated in Course 50.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

Prerequisite, Spanish 51.

75. **I. MODERN SPANISH AUTHORS.** — For seniors. Reading from modern Spanish novel and drama. Translation of English into Spanish. Private reading.

2 class hours, 4 study hours.

Credit, 6.

Professor MACKIMMIE.

Prerequisite, Spanish 52.

76. **II. MODERN SPANISH AUTHORS.** — For seniors. As stated in Course 75.

2 class hours, 4 study hours.

Credit, 6.

Professor MACKIMMIE.

Prerequisite, Spanish 75.

77. **III. MODERN SPANISH AUTHORS.** — For seniors. As stated in Course 75.

2 class hours, 4 study hours.

Credit, 6.

Professor MACKIMMIE.

Prerequisite, Spanish 76.

German and Music.

Professor ASHLEY, Assistant Professor JULIAN.

GERMAN.

The courses in German are intended to give the student a reading knowledge of the language and to introduce to him some of the masterpieces of German literature. To the student interested in pursuing advanced reading in scientific German, opportunity is given to do corollary reading in his major subject, in collaboration with the head of that department.

Required Courses.

1. **I.** 2. **II.** 3. **III.** **ELEMENTARY GERMAN.** — For freshmen; open upon arrangement to other students. Grammar, composition and reading. Especial attention is given to oral work in German and to translation of English into German. Required of those presenting French for entrance who do not continue that language and have not studied German.

3 class hours, 6 study hours.

Credit, 9, **I, III** terms.

3 class hours, 5 study hours.

Credit, 8, **II** term.

Assistant Professor JULIAN.

4. **I.** 5. **II.** 6. **III.** **INTERMEDIATE GERMAN.** — For freshmen; open upon arrangement to other students. Selected works of Schiller, Heine and Goethe. Grammar review and advanced prose composition.

3 class hours, 6 study hours.

Credit, 9, **I, III** terms.

3 class hours, 5 study hours.

Credit, 6, **II** term.

Assistant Professor JULIAN.

Prerequisite, required of freshmen who present two years of German for entrance and do not take French.

Elective Courses.

25. **I.** **INTERMEDIATE GERMAN.** — For sophomores; open upon arrangement to other students. Reading of such works as Sudermann's "Frau Sorge," "Wilhelm Tell," "Die Journalisten," etc. Grammar review.

3 class hours, 5 study hours.

Credit, 8.

Assistant Professor JULIAN.

Prerequisites, German 1, 2 and 3.

26. **II.** **INTERMEDIATE GERMAN.** — For sophomores; open upon arrangement to other students. As stated under Course 25.

3 class hours, 5 study hours.

Credit, 8.

Assistant Professor JULIAN.

Prerequisite, German 25.

27. **III.** **INTERMEDIATE GERMAN.** — For sophomores; open upon arrangement to other students. As stated under Course 25.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor JULIAN.

Prerequisite, German 26.

28. **I.** **ADVANCED GERMAN.** — For sophomores; open upon arrangement to other students. Reading and studying of Goethe's most important literary productions.

3 class hours, 5 study hours.

Credit, 8.

Professor ASHLEY.

Prerequisites, German 4, 5 and 6.

29. **II. ADVANCED GERMAN.** — For sophomores; open upon arrangement to other students. Development of the German novel; rapid reading of great novelists.

3 class hours, 5 study hours.

Credit, 8.

Professor ASHLEY.

Prerequisite, German 28.

30. **III. ADVANCED GERMAN.** — For sophomores; open upon arrangement to other students. As stated under Course 29.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

Prerequisite, German 29.

50. **I. SCIENTIFIC GERMAN.** — For juniors; seniors may elect. Reading in German of modern magazine articles and works of a scientific nature. Different work assigned according to needs of individual students.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor JULIAN.

Prerequisites, German 4, 5 and 6, or German 25, 26 and 27.

51. **II. SCIENTIFIC GERMAN.** — For juniors; seniors may elect. As stated under Course 50.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor JULIAN.

Prerequisite, German 50.

52. **III. SCIENTIFIC GERMAN.** — For juniors; seniors may elect. As stated under Course 50.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor JULIAN.

Prerequisite, German 51.

75. **I. GERMAN LITERATURE.** — For seniors. Advanced language and literary study. Conducted entirely in German. Lectures on German literature and history; life, customs and travel in Germany. Collateral readings, including masterpieces of different epochs, such as "Niebelungenlied," Goethe's "Faust" and one modern typical drama.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

Prerequisites, German 28, 29 and 30.

76. **II. GERMAN LITERATURE.** — For seniors. As stated under Course 75.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

Prerequisite, German 75.

77. **III. GERMAN LITERATURE.** — For seniors. As stated under Course 75.

3 class hours, 6 study hours.

Credit, 9.

Professor ASHLEY.

Prerequisite, German 76.

78. **I. CONVERSATION AND COMPOSITION.** — For seniors; juniors may elect. Translating connected English into German. Reproducing outside readings in German orally in class.

1 class hour, 2 study hours.

Credit, 3.

Professor ASHLEY.

Prerequisites, German 4, 5 and 6, or German 25, 26 and 27.

79. **II. CONVERSATION AND COMPOSITION.** — For seniors; juniors may elect. As stated under Course 78.
1 class hour, 2 study hours.

Credit, 3.
Professor ASHLEY.

Prerequisite, German 78.

80. **III. CONVERSATION AND COMPOSITION.** — For seniors; juniors may elect. As stated under Course 78.
1 class hour, 2 study hours.

Credit, 3.
Professor ASHLEY.

Prerequisite, German 79.

MUSIC.

Elective Courses.

50. **I. HISTORY AND INTERPRETATION OF MUSIC.** — For juniors; seniors may elect. History of music among the ancients; medieval and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the classical school, — Bach, Händel, Haydn, Gluck and Mozart.
1 class hour, 2 study hours.

Credit, 3.
Professor ASHLEY.

51. **II. HISTORY AND INTERPRETATION OF MUSIC.** — For juniors; seniors may elect. A continuation of Course 50. The Romantic school; Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera.
1 class hour, 2 study hours.

Credit, 3.
Professor ASHLEY.

52. **III. HISTORY AND INTERPRETATION OF MUSIC.** — For juniors; seniors may elect. The Modern school and Modern composers.
1 class hour, 2 study hours.

Credit, 3.
Professor ASHLEY.

DIVISION OF RURAL SOCIAL SCIENCE.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Agricultural Economics.

Professor CANCE, Assistant Professor SAWTELLE, Mr. YOUNT, Mr. SMART.¹

Instruction in agricultural economics is designed to show that the agricultural industry justified its existence chiefly as a supplier of food and raw textile materials for human consumption; that agricultural success is measured by production of values rather than by production of volume of agricultural products; that the goal of the farmer is the largest net profit over a long-time period; that agricultural production includes all processes from purchase of seed and fertilizer and preparation of seedbed until the product reaches the consumer, including collection, transportation, storage, financing, packing, handling and selling; that a knowledge of the business of agriculture and agricultural commerce is to-day more necessary than a knowledge of agricultural technique.

The work of this department is conducted by means of lectures, readings and research in both library and field. A catalogue, now containing some 12,000 cards, covering the various phases of agricultural economics, is maintained. The department is also supplied with a large collection of maps, charts and statistical reports on the prices and supply of agricultural products. A goodly number of

¹ Temporary.

regular reports of the Bureau of Markets and other divisions of the United States Department of Agriculture are available for the use of students. Two series of bound volumes of bulletins are kept in the department offices, with duplicate series in the college library; one series already contains 12 volumes on "Co-operation in Agriculture," and the other, 15 volumes on "Marketing of Farm Products."

Required Courses.

26. **II. AGRICULTURAL INDUSTRY AND RESOURCES.** — For sophomores. A descriptive course dealing with agriculture as an industry and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority and consumers' demand. The principal agricultural resources of the United States are studied with reference to commercial importance, geographical distribution, present condition and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics and discussions.

4 class hours.

1 2-hour laboratory period, 6 study hours, credit, 12.

Mr. YOUNT.

Elective Courses.

50. **I. ELEMENTS OF AGRICULTURAL ECONOMICS.** — For juniors; seniors may elect. This course is designed to accompany or follow the course in elements of economics. It deals with the economic principles underlying the welfare and prosperity of the farmer and those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; principles of rural credit; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics and field work.

5 class hours, 7 study hours.

Credit, 12.

Professor CANCE.

51. **III. THE EVOLUTION OF AGRICULTURE.** — For seniors; juniors may elect. A general survey of the evolution of the agricultural industry. Significant developments are traced and their causes and consequences studied. An attempt is made to give the student a knowledge of the changes which have taken place and which are taking place in the agricultural industry, the conditions which accompany these changes, and to furnish a basis by which the significance and the course of present and future developments in agriculture may be judged. Special emphasis will be placed on the development of agriculture in New England and the United States. Lectures, readings and library work.

3 class hours, 6 study hours.

Credit, 9.

Assistant Professor SAWTELLE.

52. **II. CO-OPERATION IN AGRICULTURE.** — For juniors; seniors may elect. The history, principles and business relations of agricultural co-operation. (1) A survey of the development, methods and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, practical working plans for co-operative associations, with particular reference to purchase of supplies and the marketing of perishable products. Lectures, text, assigned readings and practical exercises.

5 class hours, 7 study hours.

Credit, 12.

Professor CANCE.

53. **III. THE AGRICULTURAL MARKET.** — For juniors; seniors and graduate students may elect. A study of the forces and conditions which determine the prices of farm products and the mechanism, methods and problems concerned with transporting, storing and distributing them. Supply and demand, course

of prices, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market and direct sales are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies and field work.
5 class hours, 7 study hours.

Credit, 12.
Professor CANCE.

75. **II. RURAL AND BUSINESS LAW.** — For seniors; juniors may elect. Land, titles, public roads, rights incident to ownership of livestock, contracts, commercial paper and distinctions between personal and real property. Text, written exercises, lectures and class discussions.
5 class hours, 7 study hours.

Credit, 12.
Mr. SMART.

76. **II. TRANSPORTATION OF AGRICULTURAL PRODUCTS.** — For seniors and graduate students; juniors may elect. The development of highway, waterway and railway transportation and its relation to the agricultural development of the country; the principles governing the operation and control of transportation agencies; present-day problems relating to the shipment of farm products, rates, facilities and services; methods of reducing wastes in transportation; the economics of the good roads movement and of motor transportation. Lectures, text and field work.
5 class hours, 7 study hours.

Credit, 12.
Professor CANCE.

77. **I. PROBLEMS IN AGRICULTURAL ECONOMICS.** — For seniors and graduate students; juniors may elect. An advanced course for those desirous of studying more intensively some of the economic problems affecting the farmer, such as: land problems, — land tenure, size of farms, causes affecting land values, private property in land, taxation of farm property; special problems, — cost of producing farm products, farm labor in New England, immigration, agricultural credit. Opportunity is given, if practicable, for field work, and students are encouraged to pursue lines of individual interest.
5 class hours, 7 study hours.

Credit, 12.
Professor CANCE.

78. **III. AGRICULTURAL CREDIT FACILITIES.** — For seniors and juniors. Lectures, discussions and assigned readings on credit needs of farmers; the legitimate use of credit in the acquisition of land, and the production, storage and marketing of agricultural products; the development of national and State rural credit institutions and laws; the powers and methods of operation of credit institutions with reference to the supply of credit for agricultural purposes; the methods by which the individual may increase his credit standing and borrowing power; ways in which the present credit facilities may be increased.
3 class hours, 6 study hours.

Credit, 9.
Assistant Professor SAWTELLE.

79. **I. AGRICULTURAL STATISTICS.** — For seniors, juniors and graduate students. The nature and sources of agricultural statistics, the methods of obtaining numerical facts, of analyzing and drawing conclusions from statistical data, and the methods of presenting in a true and forceful manner the statistical facts of the agricultural industry. Opportunity is given in the laboratory for practice in the use of statistical methods and processes, and to acquire experience in dealing with practical statistical problems. The application of statistics and statistical methods in the fields of agricultural economics, extension work, education, journalism and the business matters connected with farm operation is emphasized.
2 class hours.

3 2-hour laboratory periods, 4 study hours, credit, 12.
Assistant Professor SAWTELLE.

80. **I. SEMINAR.** — For seniors and graduate students. Research in agricultural economics and history; problems of New England agriculture. Library work and reports. If desirable some other topic may be substituted.

1 or 2 2-hour conference periods, 1 or 2 study hours, credit, 3 or 6.

The DEPARTMENT.

81. **II. SEMINAR.** — For seniors and graduate students. As stated in Course 80.

1 or 2 2-hour conference periods, 1 or 2 study hours, credit, 3 or 6.

The DEPARTMENT.

82. **III. SEMINAR.** — For seniors and graduate students. As stated in Course 80.

1 or 2 2-hour conference periods, 1 or 2 study hours, credit, 3 or 6.

The DEPARTMENT.

83. **I. SALESMANSHIP OF AGRICULTURAL PRODUCTS.** — For seniors; juniors may elect. The course embraces a study of the principles and practices that are involved in the selling of goods and services. The application of these principles of salesmanship to the disposal of agricultural products is especially emphasized. Types of sales, motives for buying, securing interviews, types of prospects, preparation of sales talks, meeting objections and excuses, and sales demonstrations by students and the instructor are included.

2 class hours, 4 study hours.

Credit, 6.

Mr. YOUNT.

84. **III. ADVERTISING AGRICULTURAL PRODUCTS.** — For seniors; juniors may elect. A course dealing with the application of the principles of advertising to agricultural products. A study of the nature of advertising, the economics of advertising, the use of media, copy, psychology as applied to advertising, layout, the advertising campaign, advertising agency, etc., is made. The solution of practical problems to emphasize different phases of advertising is required by students.

2 class hours, 4 study hours.

Credit, 6.

Mr. YOUNT.

85. **II. AGRICULTURAL PRICES.** — For seniors and graduate students. A study of the prices of agricultural products and other commodities which are of importance in the agricultural industry. Limited to five students.

2 or 3 2-hour laboratory periods, 2 or 3 study hours, credit, 6 or 9.

Assistant Professor SAWTELLE.

86. **III. AGRICULTURAL PRICES.** — For seniors and graduate students as stated in Course 85. Limited to five students.

2 or 3 2-hour laboratory periods, 2 or 3 study hours, credit, 6 or 9.

Assistant Professor SAWTELLE.

87. **III. FOREIGN TRADE IN AGRICULTURAL PRODUCTS.** — For seniors and graduates; juniors may elect. A general course embracing a study of the principles and practices of international trade and the foreign commerce of the United States, particularly with reference to agricultural products. The development and present status of foreign trade in agricultural products, trade relations with foreign nations, the agencies and practices of foreign trade, foreign trade salesmanship and advertising, the status of New England with reference to foreign trade are some of the topics which will be presented. The work in the course will also include a personal study of special features of foreign trade and of the trade importance of specific subjects. Textbook, class discussions and class topics.

3 class hours, 6 study hours.

Credit, 9.

Mr. YOUNT.

Agricultural Education.

Professor WELLES, Professor GLICK, Mr. HEALD.¹

The primary aim of the department is to train students for service in some form of educational work. Students desiring state approval as teachers of agriculture or related subjects should confer with the head of the department as early as possible to insure a desirable range of preparation. They should also become acquainted with the State Agent for Agricultural Teacher-Training who approves candidates for positions in agricultural departments and special schools.

The department seeks to be of the greatest possible service to students who are prepared to teach and whose scholastic standing and qualifications generally seem to make them suitable candidates for positions. Students who major in other departments but expect to teach should consult this department regarding the educational courses best suited to their purposes.

The department recommends to the State Department of Education such graduates of the college as are entitled to receive the high school teachers' term certificate.

The department is thoroughly equipped for its work with classrooms, reference material, etc.

29. **II. PROBLEMS IN EDUCATION.** — For sophomores in the Division of Rural Social Science. The aim of this course is to awaken young students to the fact that what they enjoy in educational opportunities has not always existed. Our American educational policy and program is the present form of the solution of many vital problems of education. These are continually facing the newer generations as industry and living conditions change. Thinking men and women tomorrow must give attention to so vital a concern in life as education and should begin early. The work covers text, references, discussions and lectures.
3 class hours, 3 study hours.

Credit, 6.

Professor WELLES.

51. **I and II. PRINCIPLES AND METHODS OF TEACHING.** — For juniors; seniors may elect. This course is intended for students who expect to teach. Others must consult the head of the department before registering. The study covers the general principles and methods of teaching and their application to particular cases. This is an adaptation of the case plan of study. Discussions of the classroom are very important. Outside reading is required on assigned and optional matter. Observation visits to schools in session are required with full reports. Each student must prepare a lesson for teaching and teach a moot class subject to the critical analysis of the class and the instructor. A good text is the basis of the course.
5 class hours, 5 study hours.

Credit, 10.

Professor WELLES.

52. **III. HISTORY AND PHILOSOPHY OF EDUCATION.** — For juniors; seniors and graduates may elect. A general course in the history of educational theory and practice. Special emphasis is placed upon the philosophical background of education.
5 class hours, 7 study hours.

Credit, 12.

Professor GLICK.

Prerequisite, Agricultural Education 55 or the consent of the instructor.

55. **I and II. GENERAL PSYCHOLOGY.** — For juniors; seniors and graduates may elect. This is a basic course for those anticipating further study in psychology as well as a practical and cultural course for those who can take only one course in this field. It deals with the fundamental principles of psychology; the evolu-

¹ State Agent for Agricultural Teacher-Training representing the State Department of Education in the administration of vocational education acts.

tion of mind in animals and man; various types and products of social organizations; abnormal psychology including hypnotism, dreams, mental disorders, etc. 5 class hours, 5 study hours.

Credit, 10.

Professor GLICK.

56. **II and III. EDUCATIONAL PSYCHOLOGY.** — For juniors; seniors and graduates may elect. It is a direct application of psychology to the field of education and is a basic course for both general and specific methods. The course deals with the original nature of the child, the psychology of learning, individual differences, transfer of training, mental tests, etc. Intended primarily for prospective teachers, but open to others who are sufficiently interested. 5 class hours, 5 study hours.

Credit, 10.

Professor GLICK.

Prerequisite, Agricultural Education 55 or consent of the instructor.

75. **II. PRINCIPLES OF SECONDARY EDUCATION.** — For seniors; juniors may elect. This is a study of the American high school, both junior and senior. It is designed to acquaint the student with the aims and objectives of the high school and the factors upon which the realization of these aims depend. Some of the specific topics included in the study are financial support, course of study, qualifications of teachers and recent tendencies and policies in secondary education. 3 class hours, 3 study hours.

Credit, 6.

Professor GLICK.

76. **I and III. SPECIAL METHODS IN TEACHING AGRICULTURE AND RELATED SCIENCE.** — For seniors; juniors and others qualified may elect. Owing to the specialized nature of this course, the head of the department must be consulted before registration. The course aims to set out clearly the main details in teaching agriculture and related science from a vocational point of view. The home project is considered the basis. The work covers material and method, laws, policies, state requirements, common practices, teachers' subject and method outlines, project outlines, lesson plans, moot class teaching, observation, references, weekly oral and written reports, etc. The principle of job analysis is employed throughout the course.

3 class hours.

3 laboratory hours, 4 study hours, credit, 10.

Professor WELLES.

77. **III. METHODS IN EXTENSION TEACHING.** — For seniors; juniors and others qualified may elect. The nature of this course requires that only those who are definitely interested be admitted. Candidates must consult the head of the department before registering. The course consists of a survey of the field of extension work and the methods by which this work is accomplished. The specific lines dealt with are those of the county agent, boys' and girls' club leader, county demonstration agent and agricultural specialist. The administration of county, state and federal extension service is included in the discussions. Some time will be required of each student in field observation of extension work. The course will be conducted jointly by members of the Extension Service staff and the department of Agricultural Education.

3 class hours, 3 study hours.

Credit, 6.

Professor WELLES and EXTENSION SERVICE STAFF.

80. **I, II and III. SUPERVISED TEACHING.** — (Includes apprentice, practice and observation teaching.) Primarily for seniors; juniors and others qualified may be admitted by arrangement. Under certain conditions a student may absent himself from college during one term of his junior or senior year for supervised teaching. Such a procedure is particularly desired for those who are preparing to teach agriculture and is in accordance with the state plan which specifies the apprentice method of training. For detailed information, consult the head of the department.

Opportunities for practice teaching are sought on the campus and in nearby high schools for those who cannot absent themselves for a term of apprentice teaching. A limited amount of observation practice is permissible. Besides teaching, a student is required to pursue a course of professional reading bearing upon the subject he is teaching or observing. In all cases he is required to make detailed teaching plans covering the subject-matter of the lessons and to outline the supporting projects. The amount of credit depends upon the number, character and length of teaching exercises and conferences. Scheduled by arrangement.

1 class hour. 1 to 5 laboratory hours, 1 to 5 study hours, credit, 3 to 11.

The DEPARTMENT.

81. **III. SEMINAR IN METHODS OF TEACHING.** — Open to seniors majoring in Agricultural Education; graduate students and others by arrangement. This is an opportunity for those definitely intending to teach to make further studies in special lines other than agriculture, which is provided for in Agricultural Education 76. These include methods in college teaching, special methods in science, etc.

1 2-hour conference period, 1 to 3 study hours, credit, 3 to 5.

Professor WELLES.

Prerequisites, Agricultural Education 51 and 56 or equivalents.

83. **III. SEMINAR IN APPLIED PSYCHOLOGY.** — For seniors and graduates. Intended for those who desire to study the application of psychology in special fields such as salesmanship, advertising, medicine, law, public office, extension work, education, business, etc.

1 2-hour conference period, 1 to 3 study hours, credit, 3 to 5.

Professor GLICK.

Prerequisites, Agricultural Education 55 and 56 or 85.

85. **I. VOCATIONAL PSYCHOLOGY.** — For seniors and graduates. A study of psychology as applied to vocational work other than education. Emphasis is placed upon the theory and use of vocational tests, selection of men, individual aptitudes, etc.

3 class hours, 3 study hours.

Credit, 6.

Professor GLICK.

Prerequisite, Agricultural Education 55 or consent of the instructor.

Rural Sociology.

Professor —, Professor SIMS.¹

The courses in rural sociology are designed for two purposes: first, to give students an appreciation of the general problems of country life; second, to afford a definite training for students who wish to take up some specific form of social service. In the last ten years rural sociology has been introduced as a subject into more than 50 per cent of the agricultural schools and colleges. There is a good demand for teachers, and an increasing opportunity in other directions in this subject. The courses afford the student an opportunity to pursue graduate as well as undergraduate work. The library of the college is unusually well equipped with rural sociological material.

Required Course.

27. **III. ELEMENTS OF RURAL SOCIOLOGY.** — For sophomores. A broad survey of the field of rural sociology, including such topics as the origin of rural sociology, its methods and problems; relation of sociological to the scientific and technical aspects of agricultural problems; the development of the rural community in New England and the west, religious, educational and social ideals of rural people; characteristics and influence of the rural environment, the movement of the rural

¹ Absent on leave.

population, the effects of immigration; rural institutions, the school, the church, local government, effects of modern conditions of life on rural institutions; rural organization; problems of progress, an analysis of the needs of rural life in its further development. Lectures, readings and essays on assigned topics.
3 class hours, 6 study hours.

Credit, 9.
Professor SIMS.

Elective Courses.

50. **I. RURAL VILLAGE AND TOWN SOCIOLOGY.** — For juniors; seniors may elect. Village history and evolution; present status and importance of the small town; its relation to farm and city; institutional, economic, social, cultural and moral aspects; the problems of citizenship, organization and leadership presented by the small town; schemes for improvement criticized and evaluated. This course has special value for New Englanders who wish to understand their semi-urban and town communities. Lectures, discussions and topical reports.
3 class hours, 6 study hours.

Credit, 9.
Professor SIMS.

51. **II. RURAL GOVERNMENT.** — For juniors; seniors may elect. A general survey of the development of rural government in the United States, origin of the New England town, its influence upon the west, county government, the influence of the farmer in legislation, good roads movement, credit facilities, taxation, boards of agriculture, agricultural colleges and experiment stations in relation to rural welfare; national government; a general survey of political organizations and movements among farmers in the United States and foreign countries and their influence in shaping legislation; relation of the Department of Agriculture, postal system, the various national commissions and agencies to rural welfare. Lectures, readings, written exercises on assigned topics.
3 class hours, 6 study hours.

Credit, 9.
Professor SIMS.

52. **III. RURAL ORGANIZATION.** — For juniors; seniors may elect. A study of the organized agencies by which rural communities carry on their various forms of associated life, particularly a study of the ways by which the domestic, economic, cultural, religious and political institutions contribute to rural betterment; principles underlying leadership, qualifications of the paid leader and the lay leader; the field of rural social service, national, State and local, preparation and opportunity for service; rural community building, a study of organized ways and means by which aid is given local communities. The method, scope and history of local, State and national associations formed about some farm product, their influence in forming class consciousness and in shaping agrarian legislation; need of federation. Lectures, readings and essays on assigned topics.
3 class hours, 6 study hours.

Credit, 9.
Professor SIMS.

76. **I. FIELD WORK IN RURAL SOCIOLOGY.** — For seniors; juniors may elect. Designed to meet the needs of students who wish to do some constructive work in rural social service while still in college. The work is carried on in co-operation with the various college agencies engaged in rural service. Any project for which credit in this course is to be asked must first have the approval of the head of the department.

2 to 6 laboratory hours, credits, 2 to 6.
Professor SIMS.

Prerequisites, Rural Sociology 27 and preferably 50 or 52.

77. **II. RURAL SOCIAL RESEARCH AND SURVEYS.** — For seniors and juniors. A careful study is made of the scientific method as applied to social problems, the technique of investigation and research; the procedure of gathering sociological

data by means of the survey; the interpretation and graphic presentation of statistical facts. This course is indispensable for those contemplating any kind of social work. Text, lectures, and laboratory work.
3 class hours, 6 study hours.

Credit, 9.
Professor SIMS.

79. **I. SEMINAR.** — Enrollment is open to seniors, students majoring in rural sociology and others especially prepared.
1 to 3 class hours, 2 to 6 study hours.

Credit, 3 to 9.
Professor SIMS.

80. **II. SEMINAR.** — Enrollment is open to seniors, students majoring in rural sociology and others especially prepared.
1 to 3 class hours, 2 to 6 study hours.

Credit, 3 to 9.
Professor SIMS.

81. **III. SEMINAR.** — Enrollment is open to seniors, students majoring in rural sociology and others especially prepared.
1 to 3 class hours, 2 to 6 study hours.

Credit, 3 to 9.
Professor SIMS.

Rural Home Life.

Professor SKINNER, Assistant Professor KNOWLTON, Miss BARTLEY.

The emphasis of the work in Home Economics is upon home making as a fundamental vocation. To this end, not only technical courses are offered, but also those which will tend to give the student a better understanding of the place which the home should take as a factor in community life, and a sympathetic attitude toward the problems of every day life.

The work is largely prescribed in the first two years and gives the necessary basis for the development of courses in Home Economics during the junior and senior years. It is possible for graduates of this course, if they have skillfully chosen their electives in the field of agriculture or horticulture, to engage in home industries for profit and to engage in certain phases of professional work in the field of Home Economics.

The food laboratory located in Fernald Hall is fitted with individual cabinets and gas stoves. Provision is made for practice in the preparation and serving of meals with the family as a unit. The clothing laboratory located in the Abigail Adams House is provided with modern equipment. The related science is given in the laboratories of the various departments of the college.

1. **I. INTRODUCTION TO HOME ECONOMICS.** — For freshmen. Lectures on the history and evolution of the home; social customs and their value in family relationships; healthful and suitable care of the wardrobe; principles of nutrition as applied to the student's life; the student's budget, and the keeping of personal accounts.
2 class hours.

Credit, 2.
Miss SKINNER.

28. **I. 29. II. CLOTHING AND TEXTILES.** — For sophomores. A study of the selection and purchase of suitable materials, their character and cost; appropriateness and simplicity in dress. Practical laboratory work includes designing and drafting of patterns, the use of commercial patterns, and the making and repairing of garments.
2 class hours.

3 2-hour laboratory periods, 4 study hours, credit, 12.
Miss BARTLEY.

28. **III. FOODS.** — For sophomores. An introduction to the study of foods; selection, preparation and service.
2 class hours.

3 2-hour laboratory periods, 4 study hours, credit, 12.
Miss KNOWLTON.

50. **I. FOODS.** — For juniors. A study of foods in their scientific and economic aspects, with the preparation of simple breakfasts and luncheons.

2 class hours. 3 2-hour laboratory periods, 4 study hours, credit, 12.
Miss KNOWLTON.

51. **II. FOODS.** — For juniors. A further study of foods on the basis of meal planning in the home, with especial emphasis on dinners and the day's meals as a whole.

2 class hours. 2 3-hour laboratory periods, 4 study hours, credit, 12.
Miss KNOWLTON.

52. **III. DIETETICS.** — For juniors. A study of the food requirement throughout infancy, childhood, adolescence, adult life and old age, considering the energy value of foods and the nutritive properties of foodstuffs. Typical dietaries are planned for each period, with special regard to economic and social conditions.

2 class hours. 3 2-hour laboratory periods, 4 study hours, credit, 12.
Miss KNOWLTON.

53. **I. (RURAL ENGINEERING 53) HOUSE PLANNING AND CONSTRUCTION.** — For juniors. A study of the common building materials and their use in house construction. The principles of house planning will be studied and plan designs originated, consideration being given to such problems as heating, lighting, water supply and sewage disposal. The economics of house building, including financing, maintenance and overhead expense, will also be studied.

2 class hours. 2 2-hour laboratory periods, 2 study hours, credit, 8.
Miss SKINNER and Assistant Professor STRAHAN.

56. **I. CLOTHING.** — For juniors. This course aims to develop initiative, independence and art in designing garments for figures of different types, with special emphasis on proportion, color and texture. Laboratory work will be concerned with more difficult problems of garment construction.

2 class hours. 3 2-hour laboratory periods, 4 study hours, credit, 12.
Miss BARTLEY.

76. **II. HOUSEHOLD MANAGEMENT.** — For seniors. The application of the principles of scientific management to the household, and the elements of successful home making. The family income, cost of living, household accounts, the budget and its apportionment. The responsibility of the woman to her family and the community in establishing right standards of living.

4 class hours, 5 study hours. Credit, 9.
Miss SKINNER.

78. **III. HOME NURSING.** — For seniors. A study of the care of the family health; simple diseases and their prevention; the care of young children and invalids; first aid to the injured.

3 class hours, 4 study hours. Credit, 7.
Miss SKINNER.

81. **I. THE COMMUNITY OF THE HOME ECONOMICS GRADUATE.** — For seniors. This course is intended to be a practical application of Home Economics to the various social, economic, industrial and educational problems relating to the home which the Home Economics graduate may meet in any community, either as an employed worker or as a volunteer. Recommended only to those pursuing a major in Home Economics.

2 class hours. 1 2-hour laboratory period, 3 study hours, credit, 7.
Miss KNOWLTON.

82. **II. HEALTH EDUCATION.** — For seniors. This course is intended to show how the Home Economics graduate fits into the health program of the school,

either as a teacher or as volunteer worker. Recommended only to those pursuing a major in Home Economics.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.
Miss KNOWLTON.

83. **III. FIELD PROBLEMS UNDER SUPERVISION.** — For seniors. This course is intended to be a more intensive application of Home Economics to special community problems and to serve as a beginning of simple research work. Recommended only to those pursuing a major in Home Economics.

2 class hours.

1 2-hour laboratory period, 3 study hours, credit, 7.
Miss KNOWLTON.

84. **III. MILLINERY.** — For seniors. This course considers different types of hats, their appropriateness and becomingness, with practical work in designing frames, remodeling commercial frames, covering, trimming and renovating hats.

3 2-hour laboratory periods, credit, 6.
Miss BARTLEY.

GENERAL DEPARTMENTS.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Military Science and Tactics.

Major HERMAN KOBBE, Cav. (D. O. L.), U. S. A.; Captain DWIGHT HUGHES, Jr., Cav. (D. O. L.), U. S. A.; Captain THOMAS BRADY, Jr., Cav. (D. O. L.), U. S. A.; Technical Sergeant JOHN J. LEE, U. S. A., Retired; Technical Sergeant JAMES A. WARREN, Cav. (D. E. M. L.), U. S. A.; and a detachment of enlisted men of the United States Army.

Under act of Congress (July 2, 1862) military instruction under a regular army officer was required in this college of all able-bodied male students. Under act of Congress June 3, 1916, as amended by act of Congress Sept. 8, 1916, there was established at this college in April, 1917, an infantry unit of the Reserve Officers' Training Corps. Following the World War and an act of Congress (July 9, 1918) the Reserve Officers' Training Corps is in operation under the regulation of the War Department, administered by the president of the college and the professor of military science and tactics.

Beginning with the fall term, 1920-21, the infantry unit of the Reserve Officers' Training Corps was converted into a cavalry unit.

The primary object of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions, for the ultimate purpose of qualifying selected students of such institutions as reserve officers in the military forces of the United States. It is intended to attain this object during the time the students are pursuing their general or professional studies, with the least practicable interference with their civil careers, by employing methods designed to fit men physically, mentally and morally for pursuits of peace as well as war.

All candidates for a degree in a four-year course must take for two years at least three hours a week of military training.

Students in their junior and senior years, who are approved by the president and the professor of military science and tactics, may take the advanced course if they so elect. The advanced course consists of at least five hours per week and a summer camp of about six weeks during the summer vacation, between the junior and senior years. Students taking this course are paid by the Federal government at a rate to be fixed by the Secretary of War, not to exceed the value of the army ration. The rate now fixed is 30 cents per day, which amounts to about \$103 per year. Students graduating in the advanced course are eligible for commissions in the Officers' Reserve Corps, *but are not required to accept such commissions if offered.*

The uniform furnished to Freshmen and Sophomore (Basic Class) is of Olive Drab Woolen cloth, and is supplied by the Federal Government without cost.

The uniforms for the Junior and Senior (Advanced Class) are of Forest Green Woolen cloth fitted and especially made for the individual student. It is expected that eventually this uniform will be furnished for the Basic Class also. This uniform is also furnished without cost to the student.

The course for cavalry units of the Reserve Officers' Training Corps includes theoretical and practical instruction in all phases of cavalry work, so distributed over the four-year college course as to qualify students at the end of the freshman year as privates of cavalry; at the end of the sophomore year as non-commissioned officers of cavalry; and upon graduation as reserve officers. The instruction in this department covers cavalry drill, cavalry weapons, — *i.e.*, rifle, pistol, saber, automatic rifle and machine gun, — map reading and military sketching, minor tactics, equitation, etc. The course in equitation includes cross-country riding and instruction in polo. So far as season and weather permits, instruction is of a practical nature out of doors.

Required Courses.

1. **I.** — For freshmen. Theoretical and practical instruction in military science and tactics, and lectures on military subjects.

3 laboratory hours, 2 study hours, credit, 5.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

2. **II.** — For freshmen. Theoretical and practical instruction in military science and tactics, and lectures on military subjects.

3 laboratory hours, 2 study hours, credit, 5.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

3. **III.** — For freshmen. Theoretical and practical instruction in military science and tactics, and lectures on military subjects.

3 laboratory hours, 2 study hours, credit, 5.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

25. **I.** — For sophomores. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

3 laboratory hours, 2 study hours, credit, 5.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

26. **II.** — For sophomores. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

3 laboratory hours, 2 study hours, credit, 5.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

27. **III.** — For sophomores. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

3 laboratory hours, 2 study hours, credit, 5.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

Elective Courses.

50. **I.** — For juniors. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

5 laboratory hours, 4 study hours, credit, 9.
THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

51. **II.** — For juniors. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

5 laboratory hours, 4 study hours, credit, 9.

THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

52. **III.** — For juniors. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

5 laboratory hours, 4 study hours, credit, 9.

THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

75. **I.** — For seniors. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

5 laboratory hours, 4 study hours, credit, 9.

THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

76. **II.** — For seniors. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

5 laboratory hours, 4 study hours, credit, 9.

THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

77. **III.** — For seniors. Theoretical and practical instruction in military science and tactics, and lectures on military subjects. Equitation.

5 laboratory hours, 4 study hours, credit, 9.

THE PROFESSOR OF MILITARY SCIENCE
AND TACTICS, and ASSISTANTS.

Physical Education and Hygiene.

Professor HICKS, Assistant Professor GORE, Mrs. HICKS, Mr. BALL, Mr. DERBY, Mr. BIKE.

The purpose of the courses offered by this department is to provide active exercise and to instruct every student how to care for his health and maintain his physical condition while carrying on his college course.

The equipment consists of the Alumni Athletic Field, which has room for two football fields, a quarter-mile cinder track with a 220 straightaway, and the baseball diamond; and also the old field for class football and baseball, two tennis courts, and the drill hall floor for basket ball. For several years the drill hall floor was used for class work in gymnastics, but its condition has become so bad that this has been discontinued. During the winter months a hockey rink is provided on the college pond.

[All undergraduate male students are given a physical examination upon entering.]

MEN.

Required Courses.

1. **I. HYGIENE.** — For freshmen. Lectures on personal hygiene.
1 class hour. Credit, 1.
Professor HICKS.
2. **I. RECREATION.** — For freshmen. Outdoor games.
2 laboratory hours, credit, 2.
The DEPARTMENT.
3. **III. RECREATION.** — For freshmen. Outdoor games.
2 laboratory hours, credit, 2.
The DEPARTMENT.

7. **I.** 8. **II.** 9. **III.** RECREATION. — Military substitute for freshman men.
3 1-hour laboratory periods, credit, 3.
The DEPARTMENT.

25. **I.** RECREATION. — For sophomores. Outdoor games.
2 laboratory hours, credit, 2.
The DEPARTMENT.

26. **III.** RECREATION. — For sophomores. Outdoor games.
2 laboratory hours, credit, 2.
The DEPARTMENT.

30. **I.** 31. **II.** 32. **III.** RECREATION. — Military substitute for sophomore men.
3 1-hour laboratory periods, credit, 3.
The DEPARTMENT.

Elective Course.

77. **III.** TRAINING COURSE. — For seniors. Election by permission only.
History of physical education and supervision of athletics.
2 class hours, 3 study hours.
Credit, 5.
Professor HICKS.

WOMEN.

Required Courses.

4. **I.** RECREATION. — For freshmen. Outdoor games.
3 laboratory hours, credit, 3.
Mrs. HICKS.

5. **II.** GYMNASTICS. — For freshmen. Dancing, Swedish games, etc.
3 laboratory hours, credit, 3.
Mrs. HICKS.

6. **III.** RECREATION. — For freshmen. Outdoor games.
3 laboratory hours, credit, 3.
Mrs. HICKS.

27. **I.** RECREATION. — For sophomores. Outdoor games.
3 laboratory hours, credit, 3.
Mrs. HICKS.

28. **II.** GYMNASTICS. — For sophomores. Dancing, Swedish games, etc.
3 laboratory hours, credit, 3.
Mrs. HICKS.

29. **III.** RECREATION. — For sophomores. Outdoor games.
3 laboratory hours, credit, 3.
Mrs. HICKS.

Elective Courses.

50. **II.** GYMNASTICS. — For juniors. Dancing, Swedish games, etc.
3 laboratory hours, credit, 3.
Mrs. HICKS.

76. **II.** GYMNASTICS. — For seniors. Dancing, Swedish games, etc.
3 laboratory hours, credit, 3.
Mrs. HICKS.

THE LIBRARY.

The general college library consists of all books belonging to the college, including the library of the Experiment Station and all divisional and departmental collections of books. The main collection now occupies the entire building, which was originally intended to serve the purposes of both chapel and library. A dictionary card catalogue is intended ultimately to cover all material in the general college library, which now comprises approximately 70,000 volumes, besides much unbound or paper-bound material, pamphlets, periodicals and newspapers. The library contains also some important special collections of books, amounting to several thousand volumes, not yet catalogued. Much of the constantly increasing pamphlet and periodical material, even though it is not yet comprehended in the general catalogue, is made promptly available by means of check lists, indexes, bibliographies and other library helps. Files of important periodicals make readily accessible to readers the latest contributions to the sum of human knowledge by contemporary leaders in many fields of thought and investigation. Works dealing with the sciences related to the processes and problems of agriculture are in greatest abundance, but literature, history and sociology are also well represented in our collections of books. The reading room is well supplied with encyclopedias and other general reference books, and with current numbers of an attractive list of popular and technical magazines and periodicals.

The greater part of the library material has been recently reclassified and recatalogued in accordance with a standard system, and is thereby rendered at all times directly accessible to teachers and students as well as library workers. From time to time informal lectures on the use of the library will be given to groups of students. By seminar and laboratory methods, individual students will be taught to appreciate books as essential sources of information and culture, and will be instructed in the use of the various devices common in libraries for finding what the library contains. All members of the college community have the privilege of free access to the book stacks for reference purposes, and books not specially reserved may be loaned for extra-library use for a period of two weeks.

The library is open from 8 A.M. to 9.30 P.M. on week days, and from 9 A.M. to 1.30 P.M. on Sundays while college is in session. Shorter hours prevail during vacation.

THE GRADUATE SCHOOL.

EDWARD M. LEWIS, A.M., Acting President of the College.

CHARLES E. MARSHALL, Ph.D., Director of the Graduate School and Professor of Microbiology.

GRADUATE STAFF, 1924-1925.

Acting President LEWIS, Director MARSHALL, Professors ALEXANDER, ANDERSON, BEAUMONT, CANCE, CHAMBERLAIN, CLARK, CRAMPTON, FERNALD, FOORD, GRAHAM, LINDSEY, OSMUN, PETERS, SEARS, SHAW, THAYER, TORREY, WAUGH, WELLES, WERKMAN; Mr. WATTS, Secretary.

HISTORY AND AIMS.

This college has provided study of a graduate nature for many years. The need for such training became real when agriculture was recognized as an aggregate of the many sciences involved and the many practices employed. The obsolete notion that agriculture is only farming has been replaced by the notion that farming, as such, is only one element in agriculture. The ramifications and divisions of agriculture are many; most of these call for advanced study and training to meet the exigencies of the times. No apology is, therefore, required for an attempt to fathom the scientific, economic and social intricacies of such a fundamental phase of human effort as agriculture. The value of such an undertaking is, or should be, patent to every intelligent mind familiar with the situation.

Graduate work has been available to students since 1893. At that time it was possible to qualify for the degree of master of science; later, in 1898, for the degree of doctor of philosophy; in 1913, for the professional degrees of master of agriculture and doctor of agriculture; in 1916, for the specific professional degree of master of landscape architecture.

To make the graduate work more effective and distinctive in agriculture, the graduate school was established in 1908. It has become the operating agency for the purpose of fitting graduates of this and other institutions for teaching in colleges, high schools and other public schools; for positions as government, State and experiment station specialists in farm management, dairying, livestock husbandry, poultry science, agronomy, landscape gardening, pomology, vegetable gardening and floriculture; for positions as bacteriologists, botanists, chemists, entomologists; for economists and social workers; and for numerous other positions requiring a great amount of scientific and professional agricultural knowledge, training and experience.

ORGANIZATION.

The school is based upon the department as the unit, and the apprenticeship system as the most effective means of instruction. This gives to the student individuality in treatment and an intimacy with actual conditions of work and operations. The student is assigned to an advisory committee, composed of the instructor in charge of his major subject as chairman, and instructors in charge of his minor subjects as members, which directs his graduate studies. The chairman of all these committees together constitute the graduate staff, which controls the policy of the graduate school.

ADMISSION.

Admission to the graduate school will be granted: —

1. To graduates of the Massachusetts Agricultural College.

2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of good standing, but has not, as an undergraduate, taken as much of the subject he selects for his major as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that subject as the instructor in charge may consider necessary. He shall do this without credit toward his advanced degree.

Admission to the graduate school does not necessarily admit to candidacy for an advanced degree, — students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership in the graduate school should be presented to the director of the school. Full statements of the applicant's previous training, of the graduate work desired, and of the amount and kind of work already done by him as an undergraduate should be submitted, together with a statement whether the applicant desires to work for a degree.

Registration is required of all students taking graduate courses, the first registration being permitted only after the student has received an authorization card from the director.

NATURE, METHODS AND REQUIREMENTS OF GRADUATE WORK.

Graduate work differs from undergraduate work in its purposes and methods. The primary aims of the instructor are emphasized in an attempt to have the student adjust himself and place himself in his environment; develop the rule of self-direction and self-instruction; acquire the power of accurate reasoning; gain proficiency and skill in his selected field of study or practice; and obtain an appreciative and discriminative insight into experimentation and original research. Methods are not devised, therefore, for attractiveness, entertainment and superficial reviews, but for the creation of initiative and profound thought, thorough acquaintance with detail, independent advance and industrious habits. Careful readings, lectures, conferences, surveys, laboratory exercises and field work are some of the agencies utilized.

All members of the graduate school are required to attend the course of lectures designed to supplement the technical work of all graduate studies. These lectures will be given once each week, and the students will be held responsible for the work.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major and the others as minors. No two of these subjects may be taken in the same department. An original thesis shall be considered a part of the major subject.

Candidates for the degree of doctor of agriculture are required to select a major and such other subjects as will develop the major in its greatest intensity and comprehensiveness. Successful experience is also requisite, together with a thesis which represents a masterly survey or intimate study through accurate application of some phase of the major subject.

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as a major and the other as a minor. When desirable, and approved by the Director, the minor may be made up of subjects from more than one department. The major and minor subjects may not be selected in the same department. An original thesis is considered a part of the major subject.

Candidates for the degree of master of agriculture are allowed greater privileges in the selection of subjects, but will be required to select a major and such other supporting lines of study as will be necessary to equip the individual professionally.

Candidates for the degree of master of landscape architecture will be expected to conform to the established courses of the department, and to the requirements of the department in the preparation of a thesis, as well as in actual experience outside the college.

Candidates for membership in the graduate school who do not desire to work for a degree may, with the approval of the director of the school, take more than one subject in the same department, or pursue work in several departments, if their preparation will permit. A statement of the subjects chosen must in each case be submitted to the director of the graduate school for approval. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is essential to successful graduate work, and students not having this will find it necessary to acquire it as soon as possible after entering. Other modern languages may be substituted if considered more valuable.

The graduate staff reserves the privilege of recommending and allowing courses in other institutions as a part of residence instruction. Such supervision will be exercised and credit granted as are essential to the highest standards of efficiency.

THESES.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject; must show that its writer possesses the ability to carry on constructive study; must be an actual contribution to knowledge; and possess real merit.

The thesis in its final form must be submitted to the director by May 15 of the year in which the student is to present himself for the advanced degree, and before he may take the required examination. Three complete copies are required. One of the copies is to be retained as an official copy by the director, one is to be deposited in the college library, and the third is to be retained by the department in which the thesis was prepared. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in his thesis.

FINAL EXAMINATIONS.

For the degree of doctor of philosophy or doctor of agriculture, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the graduate staff.

For the degree of master of science, master of agriculture or master of landscape architecture, a final examination upon the minor taken is given upon the completion of each course, and in the major a final examination, which may be either written or oral, or both, is given over all the work by the department concerned.

DEGREES CONFERRED.

The degrees of doctor of philosophy and doctor of agriculture are conferred upon graduate students who have met the following requirements:—

1. The devotion of at least three years¹ to the prosecution of three subjects of study and research in residence at the college.

2. The earning of not less than one hundred credits in the chief or major subject, and of not less than twenty-five credits in each of two minor subjects.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge and accompanied by drawings if necessary. For the degree of doctor of agriculture the thesis may be modified to meet professional requirements.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the instructors in charge.

¹ All time statements refer to minimum time.

5. A public oral examination.

6. The payment of all fees and college expenses required.

The degrees of master of science, master of agriculture and master of landscape architecture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least one year and a half to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence. In the case of a master of landscape architecture the student must follow the prescribed course of study.

2. The earning of not less than fifty credits in the chief or major subject, and of not less than twenty-five credits in the minor subject. Students pursuing the course in landscape architecture will devote all of their time to the established course, and meet the conditions of one year of experience outside the college.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science, master of agriculture, or master of landscape architecture is \$10, and for the degree of doctor of philosophy or doctor of agriculture, \$25.

COURSES OFFERED.

Courses available as major subjects for the degree of doctor of philosophy: —

Agricultural Economics.
Agronomy.
Botany.
Chemistry.
Entomology.

Horticulture.
Microbiology.
Pomology.
Rural Sociology.

Courses available as major subjects for the degree of master of science: —

Agricultural Economics.
Agricultural Education.
Agriculture.
Agronomy.
Animal Husbandry.
Botany.
Chemistry.
Entomology.

Horticulture.
Mathematics and Physics.
Microbiology.
Pomology.
Poultry Science.
Rural Sociology.
Veterinary Science.

Courses available as major subjects for the degree of master of agriculture: —

Agronomy. Animal Husbandry. Poultry Science.

The course in Landscape Architecture leads to the degree of master of landscape architecture.

Courses available as minor subjects: —

Agricultural Economics.
Agricultural Education.
Agriculture.
Agronomy.
Animal Husbandry.
Animal Pathology.
Botany.
Chemistry.
Entomology.

Horticulture.
Landscape Architecture.
Mathematics and Physics.
Microbiology.
Pomology.
Poultry Science.
Rural Sociology.
Zoölogy.

GENERAL OUTLINE OF COURSES FOR ADVANCED DEGREES.

Agricultural Economics.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had the following courses or their equivalent: Economics and Sociology 51, Agricultural Economics 26 and 50.

REQUIRED WORK. — Candidates must take the following courses: Agricultural Economics 51, 52, 53 and 79. These courses, specially arranged for graduates, may be taken as Courses 120, 170, 155 and 180 for graduate credit. In addition, candidates must take Courses 110, 111, 130, 165 and 175 in Agricultural Economics; Rural Sociology 27 and 50, or equivalent courses; and Economics and Sociology 50 and 77, or equivalent courses.

Each candidate will be required to have a working knowledge of the general field of economics, the history of agricultural economics, the theory of agricultural economics, the problems of agricultural production, land tenure, land problems, agricultural commerce, agricultural co-operation, agricultural credit, statistics of agriculture, and prices, markets and marketing.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — The same as for the degree of doctor of philosophy, except that there is no language requirement.

GRADUATE COURSES OFFERED.

110. THEORY OF AGRICULTURAL ECONOMICS. — Readings in French, German and English on economics of agriculture. Alternate years, odd, 200 hours.

Credits, 3.

Professor CANCE.

111. CURRENT ECONOMIC PROBLEMS AND LITERATURE. — Department seminar throughout the year.

Credit, 1 each term.

120. HISTORICAL AND COMPARATIVE AGRICULTURE. — General survey. May be taken in connection with Course 51. Spring term, yearly.

Credits, 3.

Assistant Professor SAWTELLE.

121-122. HISTORY OF AMERICAN AGRICULTURE. — Special studies in the history of agricultural institutions, practices or relations. Fall term, even years.

Credits, 5.

Assistant Professor JEFFERSON.

130. PROBLEMS OF AGRICULTURAL PRODUCTION. — The relation of the farmer to the food supply. May be taken in connection with Course 77. Fall term, yearly.

Credits, 5.

Professor CANCE.

140. LAND TENURE AND THE ACQUISITION OF FARM LAND. — Readings, discussion, original exercises. Alternate years, even.

Credits, 3-5.

Professor CANCE.

145. FARM LABOR. — Reading and investigation.

Credits, 3.

Professor CANCE.

150. AGRICULTURAL COMMERCE, INDUSTRY AND TRADE. — A study of trade movements and commercial activities relating to agricultural products. Fall term, alternate years, odd. Credits, 3-5.

Assistant Professor JEFFERSON.

155. THE AGRICULTURAL MARKET. — A study of the forces, methods and institutions of the market for agricultural products. Spring term, yearly.

Credits, 5.

Professor CANCE.

156. SPECIFIC PROBLEMS IN MARKETING FARM PRODUCTS. — Reports and discussions. Alternate years, odd. Credits, 3.

Professor CANCE.

160. AGRICULTURAL PRICES. — Winter term, yearly.

Credits, 3.

Assistant Professor SAWTELLE.

161. AGRICULTURAL PRICES. — Spring term, yearly.

Credits, 3.

Assistant Professor SAWTELLE.

165. TRANSPORTATION OF AGRICULTURAL PRODUCTS. — Elementary discussion and report. Winter term, yearly.

Credits, 5.

Professor CANCE.

166. SPECIFIC TRANSPORTATION PROBLEMS. — Original study, reading and report on certain transportation problems related to agriculture. Alternate years, odd.

Credits, 3-5.

Assistant Professor SAWTELLE.

170. CO-OPERATION IN AGRICULTURE. — Elementary problems and discussion. May be taken in connection with Course 50. Winter term, yearly.

Credits, 5.

Professor CANCE.

171-172. SPECIAL PROBLEMS IN CO-OPERATION FOR ECONOMIC PURPOSES. — Study, original investigation and discussion. Every third year, beginning 1922.

Credits, 3-5.

Professor CANCE.

175. AGRICULTURAL CREDIT. — Readings and reports in addition to class lectures on agricultural credit. Taken in connection with Course 78. Spring term, yearly.

Credits, 3-5.

Assistant Professor SAWTELLE.

180. ELEMENTARY PRINCIPLES OF STATISTICS. — Chiefly related to agriculture. Lectures, laboratory studies and original work. Taken in connection with Course 79. Fall term, yearly.

Credits, 5.

Assistant Professor SAWTELLE.

181. SPECIFIC PROBLEMS IN STATISTICS OF AGRICULTURE. — Alternate years, even.

Credits, 3-5.

Assistant Professor SAWTELLE.

185. RURAL LAW. — Corresponds to Course 78. Spring term, yearly.

Credits, 5.

Mr. SMART.

186. STUDIES IN AGRICULTURAL LEGISLATION.

Credits, 3-5.

The DEPARTMENT.

190-195. INVESTIGATION OF VARIOUS PROBLEMS RELATED TO AGRICULTURAL ECONOMICS. — Credit given on basis of time spent and reports submitted.

200. THESIS. — Research work in agricultural economics will be developed by four principal methods, namely, historical, statistical, accounting and general field investigation. In all instances mastery of research methods includes facility in investigation, tabulation and interpretation of results.

Agricultural Education.

MAJOR REQUIREMENTS.

For the Degree of Master of Science.

PREREQUISITE WORK. — A minimum of 25 undergraduate credits distributed among the following lines of study: philosophy, psychology, history of education, principles and methods of teaching, school organization and administration.

REQUIRED WORK. — At least 50 credits must be earned from the following list of courses in the department or met by accepted transferred credits.

GRADUATE COURSES OFFERED.

100. HISTORY OF EDUCATION.	Credits, 1-10.
104. VOCATIONAL EDUCATION.	Credits, 1-10.
105. CURRICULUM STUDY.	Credits, 1-20.
110. RURAL EDUCATION.	Credits, 1-15.
115. VOCATIONAL TEACHER TRAINING.	Credits, 1-10.
120. THEORY AND USE OF MENTAL TESTS.	Credits, 1-20.
125. SECONDARY EDUCATION.	Credits, 1-15.
130. ADVANCED EDUCATIONAL PSYCHOLOGY.	Credits, 1-20.
135. EDUCATIONAL PHILOSOPHY.	Credits, 1-20.
140. GENERAL EDUCATIONAL RESEARCH.	Credits, 1-20.
145. TEACHING METHOD AND PRACTICE.	Credits, 1-10.
200. THESIS.	Credits, 15-35.

MINOR REQUIREMENTS.

Minor work is offered in the department for the degrees of doctor of philosophy and master of science. Candidates must have had the equivalent of 15 undergraduate credits in education.

Agronomy.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had undergraduate courses 25 and 27 as described in this catalogue, and should have had thorough training in the elements of the natural sciences.

REQUIRED WORK. — Studies will be assigned from the courses listed below. Thesis problems may be chosen in the subject matter of soils, fertilizers or field crops.

For the Degree of Master of Science.

PREREQUISITE WORK. — As above.

REQUIRED WORK. — Assigned work will be selected from the courses listed below.

For the Degree of Master of Agriculture.

PREREQUISITE WORK. — The same as for the degree of master of science in so far as it is essential to establish the professional approach to agronomy, but in addition the candidate must be familiar with agronomical practices.

REQUIRED WORK. — As above.

GRADUATE COURSES OFFERED.

110. STUDIES IN THE CULTURE OF FIELD CROPS.	Credits, 5-20.
115. THE FERTILIZATION OF FIELD CROPS.	Credits, 5-20.
120. STUDIES IN HARVESTING AND STORAGE.	Credits, 5-20.
125. THE IMPROVEMENT OF FIELD CROPS.	Credits, 5-20.
130. TECHNOLOGY OF FIELD CROPS.	Credits, 5-20.
140. SOIL CLASSIFICATION.	Credits, 5-20.
145. STUDIES IN SOIL PHYSICS.	Credits, 5-20.
150. MOISTURE RELATIONSHIPS IN SOILS.	Credits, 5-20.
155. STUDIES IN SOIL MANAGEMENT.	Credits, 5-20.
160. SOIL TECHNOLOGY.	Credits, 5-20.
170. STUDIES IN SOIL FERTILITY.	Credits, 5-20.
180. FERTILIZER TECHNOLOGY.	Credits, 5-20.
190. STUDIES IN LITERATURE.	Credits, 5-20.
200. THESIS.	Credits, 15-50.

MINOR REQUIREMENTS.

Prerequisites are as stated for major work. In addition studies suited to the needs of the candidate will be selected from the above courses.

Animal Husbandry.

MAJOR REQUIREMENTS.

For the Degree of Master of Science or Master of Agriculture.

PREREQUISITE WORK. — Candidate must have had the following courses, or their equivalents, before he can enter graduate work in this department: Animal Husbandry 25, 26, 50, 51, 52, 53, 75 and 78. He should also be able to show evidence of experience in practical animal husbandry.

REQUIRED WORK. — At least 50 credits must be earned from the following list of courses offered by the department.

GRADUATE COURSES OFFERED.

100. ADVANCED BREED HISTORY.	Credits, 10.
110. NUTRITION OF FARM ANIMALS.	Credits, 10.
120. REPRODUCTION OF FARM ANIMALS.	Credits, 10.
200. THESIS.	Credits, 25.

MINOR REQUIREMENTS.

Minor work in animal husbandry may include undergraduate Courses 50, 51, 53, 81 or 82, and such other work in reading and compilation of material as the instructor may outline. Written examinations will be conducted at the completion of each term's work.

Animal Pathology.

MINOR REQUIREMENTS.

Minor work in animal pathology for the degrees of doctor of philosophy and master of science consists of an especially planned course for graduate students. This is not an undergraduate course, but is arranged to meet the needs of graduate students who have not pursued a course in general pathology. It will continue throughout the year and include reviews in gross and microscopic anatomy, physiological, bacteriological, serological, biochemical and morbid anatomical phases of pathology. Written examinations will be given at the end of each term.

100. GENERAL PATHOLOGY. — As described above, fall term.	Credits, 5.
120. GENERAL PATHOLOGY. — Continuation of 100, winter term.	Credits, 5.
140. GENERAL PATHOLOGY. — Continuation of 120, spring term.	Credits, 5.
160. BIOCHEMICAL PHASES OF PATHOLOGY. — Second year, fall term.	Credits, 5.
180. PATHOLOGICAL HISTOLOGY. — Second year, winter term.	Credits, 5.

Professor GAGE.

Botany.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — The equivalent of certain undergraduate courses, determined by the department in the case of each student, is prerequisite.

REQUIRED WORK. — Candidates will be required to take Courses 100 through 107, and 180, 190 and 200. Courses 150 through 155 may be taken for graduate credit in certain cases. The maximum number of major credits which may be earned in this way is thirty-two.

For the Degree of Master of Science.

PREREQUISITE WORK. — The requirements are the same as for the degree of doctor of philosophy.

REQUIRED WORK. — Candidates will take Courses 100 and 101 and all courses from 102 through 107 which are given during their term of residence, also 180, 190 and 200. In certain cases Courses 150 through 155 may be taken, but not more than 20 credits may be earned in this way.

GRADUATE COURSES OFFERED.

Courses 100 through 106 are lecture courses. They are given in rotation, except Courses 100 and 101, which come every year.

100. PLANT PHYSIOLOGY. — The lectures will consider, under the nutrition of the plant: its chemical structure, absorption of various nutrient substances and their changes in the plant, assimilation and dissimilation of carbon and nitrogen by autotrophic and heterotrophic plants; under changes in the form of plants: growth and form under constant external factors, the influence of variable external and inner factors on growth, form and development; and under plant movements: the various tropisms, nutations, etc. Supplemental demonstrations, laboratory work and readings in the standard texts and journals. One lecture a week for 36 weeks. Credits, 3.

101. PLANT PATHOLOGY. — A general consideration of the history, nature and causes of plant disease; parasitism, predisposition, immunity, degeneration, natural and artificial infection, dissemination, epidemics, biologic strains, monstrosities and malformations, proliferation, prevention and control, economics of plant diseases. One lecture a week for 36 weeks. Credits, 3.

102. PLANT INHERITANCE. — This course is planned to give the student a comprehensive understanding of the principles and facts of plant inheritance. A study is made of plant variations, Mendel's law of heredity, the physical basis of heredity as established by chromosome behavior, pure lines, mutations, species and graft hybrids, etc. One lecture a week for 12 weeks. Credit, 1.

103. BIOLOGIC RELATIONS. — Consideration of certain phases of the morphological and physiological adaptations of plants with regard to insect visit; the rôle of thorns, hairs, tendrils, glands, etc. Various experiments are made to test out experimentally some of the existing theories concerning biologic adaptations. One lecture a week for 12 weeks. Credit, 1.

104. THE ECOLOGY OF PLANTS. — This course deals with the water, light and temperature relations of plants, and the various adaptations in response to these factors; the various types of plant formation; the migration of plants; the competition of plants; invasion and successions of plants under varied conditions; and the various types of alternations and zonations. One lecture a week for 12 weeks. Credit, 1.

105. PHYSIOLOGICAL PLANT PATHOLOGY. — This course considers those plant diseases not due to bacterial or fungous parasites, but resulting from unfavorable physical or chemical conditions of the soil; from harmful atmospheric influences, such as too dry air, too much moisture, hail, wind, lightning, frost; from injurious gases and liquids; from lack of or too much light; from wounds. A knowledge of the normal physiology of the plant is required. Demonstrations and laboratory work will be given, together with assigned readings. One lecture a week for 12 weeks. Credit, 1.

106. HISTORY OF BOTANY. — An historical survey of the science; lives of noted botanists; history of certain culture plants, such as wheat, corn, coffee, potato, rice, and their influence on civilization; reading. One lecture a week for 24 weeks. Credits, 2.

107. METHODS IN DRAWING AND PHOTOGRAPHING FOR THESIS AND PUBLICATION. — Twelve weeks. Credits, 1-3.

108. THE COMPARATIVE ANATOMY OF GREEN PLANTS. — See undergraduate Courses 61-63.

150. SYSTEMATIC MYCOLOGY. — See undergraduate Courses 52-54.

151. SYSTEMATIC BOTANY OF THE HIGHER PLANTS. — See undergraduate Courses 58 and 59.

152. PLANT HISTOLOGY. — See undergraduate Courses 55 and 56.

153. CYTOLOGY AND EMBRYOLOGY. — See undergraduate Courses 82 and 83.

154. PLANT PATHOLOGY. — See undergraduate Courses 75-77.

155. PLANT PHYSIOLOGY. — See undergraduate Courses 78-80.

180. SEMINAR. — A weekly seminar for members of the department staff, graduate students and major senior students is held, at which important botanical papers are discussed. Attendance and participation are required. Credits, 3.

190. COLLATERAL READING. — Extensive reading of botanical literature in English, German and French, designed to give the student a broad knowledge of the science, is required of all major students. Final examinations are based in part upon this reading course. Credits, 5-10.

200. THESIS. — Each major student is required to select a problem in plant pathology or physiology (in other branches at the discretion of the department) for original investigation, and the thesis must embody a distinct contribution to knowledge. An effort will be made to assign problems having some bearing on scientific and economic agriculture. The thesis work counts for not more than 50 per cent of the total number of major credits required for either degree.

MINOR REQUIREMENTS.

For a minor a student may take such of the work offered by the department as seems best suited to his major course. Courses 150 and 155 are primarily undergraduate work which may be taken for minor credit toward advanced degrees. In most cases no problem will be assigned.

Professors OSMUN, ANDERSON, CLARK, TORREY and DAVIS.

Chemistry.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — The candidate must have taken undergraduate Courses 1 to 87, or their equivalent.

REQUIRED WORK. — The candidate will be required to take all the graduate courses listed below. He may also be required to spend at least two terms or one semester at some other recognized institution, pursuing graduate study in chemistry. For the final examinations, questions will be selected from the entire field of chemistry, with special emphasis upon the lines of work covered by the research.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as that required for the degree of doctor of philosophy.

REQUIRED WORK. — The candidate will be required to take Courses 101 and 108 through 114. In addition he will pursue the requirements of one of the following thesis subjects:—

Organic and Biochemistry. — Course 200 and either 105, 106 or 107, and 3 credits for one term selected from Courses 103 (b) or (f), and 104.

Analytical and Industrial Agricultural Chemistry. — Courses 200, 103 (3 credits), and 3 credits for one term selected from Courses 102 and 104 through 107.

Physical Chemistry. — Courses 200, 104, and 3 credits for one term selected from Courses 102, 103 and 105 through 107.

Agricultural Chemistry. — Courses 200, 103 (3 credits), and 3 credits for one term selected from Courses 102 and 104 through 107.

The candidate must pass a final written and oral examination before the department upon undergraduate Courses 1 through 80, as well as upon all graduate work taken in chemistry.

GRADUATE COURSES OFFERED.

101. INORGANIC PREPARATIONS. — Laboratory. The preparation of chemical products from raw materials. The manufacture and testing of pure chemicals. The laboratory work is essentially synthetic in nature, and is designed to aid in acquiring a more adequate knowledge of inorganic chemistry than is to be obtained by chemical analysis alone. Ten to fifteen of the preparations given in Biltz's "Laboratory Methods of Inorganic Preparations" will be made by each student. Any term.

Credits, 3.

Assistant Professor SEREX.

102. ADVANCED INORGANIC PREPARATIONS. — Laboratory. Continuation of Course 101. Any term.

Credits, 3.

Assistant Professor SEREX.

103. ADVANCED ANALYTICAL CHEMISTRY. — Laboratory. This course may be taken in part as follows: (a) electrolytic analysis, 3 credits; (b) ultimate analysis, 3 credits; (c) special analytical work to meet the needs of the individual student, 3 credits. In addition, parts of undergraduate Courses 62, 76 and 77 may be taken, as follows: (d) fertilizers, 3 credits; (e) insecticides, 3 credits; (f) milk and butter, 3 credits. (a), (b), (c) may be taken any time; (d), (e), (f) must be taken at the time the undergraduate course is given.

Professor PETERS.

104. ADVANCED PHYSICAL CHEMISTRY. — Laboratory. Measurement of the electrical conductivity of solutions; degree of ionization; ionization constants; per cent hydrolysis of aniline hydrochloride from conductivity measurements; solubility product by the conductivity method; velocity of saponification by conductivity; neutralization point by conductivity; vapor pressure determinations; critical temperature of carbon dioxide or sulphur dioxide; transport numbers; preparation and properties of colloidal solutions; transition points by dilatometric method; heat of solution of ammonium chloride and potassium nitrate; adsorption of iodine by charcoal; splitting of racemic glyceric or racemic tartaric acid into its optical components. To each student separate work will be assigned. Any term.

Credits, 3.

Assistant Professor SEREX.

105. ADVANCED ORGANIC PREPARATIONS. — Laboratory. The preparation of compounds not included in Courses 51 and 52, such as the Kolbe synthesis of salicylic acid; benzophenone and Beckmann's rearrangement; rosaniline, malachite green, Congo red, indigo and other dyes; synthesis of fructose; Grignard reaction. Barnett, Cain & Thorpe, Gattermann, Noyes, Fischer and other laboratory guides are used. To each student separate work will be assigned. Any term.

Credits, 3.

Professor CHAMBERLAIN.

106. ADVANCED BIOCHEMISTRY. — Laboratory. The hydrolysis of proteins and isolation of the amino acids; the study of milk, blood and urine; dietary and digestion studies. References: Abderhalden, Plimmer, Salkowski, Hawk, etc. To each student separate work will be assigned. Any term.

Credits, 3.

Professor CHAMBERLAIN.

107. INDUSTRIAL ORGANIC CHEMISTRY. — Laboratory. The preparation, on a large scale, of wood alcohol, acetic acid, ethyl alcohol, benzene and cellulose products, such as mercerized cotton and artificial silk. References: Molinari, Rodgers & Aubert, Thorpe, Enzyklopädie der tech. Chemie, etc. To each student separate work will be assigned. Any term. Credits, 3.

Professor CHAMBERLAIN.

108. THEORETICAL CHEMISTRY. — Lectures. The following topics are considered: the compressibility of the atoms; the structure of atoms; the electron conception of valence. First term. Alternates with Course 109. Credit, 1.

Professor PETERS.

109. ANALYTICAL CHEMISTRY. — Lectures. A general survey of methods and technique covering processes commonly carried out in the laboratory. Gooch's "Quantitative Analysis" is used as a text. First term. Alternates with Course 108. Credit, 1.

Professor PETERS.

110. ORGANIC CHEMISTRY. — Lectures. Some of the following topics will be considered both theoretically and industrially: alkaloids, synthetic dyes, essential oils, terpenes, rubber, etc.; the study of methods for carrying out general reactions; isomerism, tautomerism, condensation, etc. References: Cain & Thorpe, Cohen, chemical monographs, Lassar-Cohn, Heinrichs, Molinari. Second term. Alternates with Course 111. Credit, 1.

Professor CHAMBERLAIN.

111. BIOCHEMISTRY. — Lectures. Some of the following topics will be considered both chemically and physiologically: fats, cholesterol, lecithin, carbohydrates, amino acids, proteins, urea, uric acid, purine bases, enzymes, fermentation, animal food and nutrition, photosynthesis. References: Monographs on biochemistry, Abderhalden, Plimmer, Haas & Hill, Lewkowitsch, Fischer, Euler, Mathews, Czapek. Second term. Alternates with Course 110. Credit, 1.

Professor CHAMBERLAIN.

112. THEORETICAL AND PHYSICAL CHEMISTRY. — Lectures. The relation between the constitution and properties of compounds; mutarotation; steric hindrances; stereoisomerism of other elements than carbon; molecular association; similarity between the compounds of silicon and carbon. Third term. Alternates with Course 113. Credit, 1.

Assistant Professor SEREX.

113. THEORETICAL AND PHYSICAL CHEMISTRY. — Lectures. Radioactivity; the application of physical chemistry to industrial chemistry. Third term. Alternates with Course 112. Credit, 1.

Assistant Professor SEREX.

114. SEMINAR. — Conferences, reports or lectures. Three terms, twice a month. Credit, $\frac{1}{2}$.

Professor LINDSEY.

200. THESIS. — Research, and, in the case of a degree, the preparation of an acceptable thesis in agricultural, analytical, organic or physical chemistry, under the direction of the professor in charge of the work, provided that a candidate for the degree of doctor of philosophy shall have had the equivalent of Courses 51, 52, 65 and 86. Credit determined by work done.

MINOR REQUIREMENTS.

Work may be selected from any of the undergraduate Courses 27 and 51 to 80, or any of the graduate courses for which the student is prepared. In addition, the candidate may be required to pass a final written and oral examination before the department upon his entire minor work.

Entomology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Students must have had all the undergraduate courses given at this college or their equivalent. Opportunities to make up any deficiencies will be available while the graduate work is being carried on.

REQUIRED WORK. — The graduate courses consist of lectures on all, and laboratory work on a part, of the subjects given below, together with advanced readings, seminar work and original research.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — A major course for the master of science degree will be about half of the courses listed below.

GRADUATE COURSES OFFERED.

100. MORPHOLOGY. — 1. Embryonic development of insects and polyembryony.
2. Metamorphosis and its interpretations.
3. Advanced external and internal anatomy.
4. Insect histology and physiology.
5. Ancestry and development of insects, including fossil insects.
6. Hermaphrodites in insects.
7. Hybrids.
8. Parthenogenesis, pedogenesis and heterogeny.
9. Chemistry and physics of insect colors.
10. Color patterns, their significance and value.
11. Luminosity.
12. Deformities.
13. Variation in insects.

120. ECOLOGY. — 1. Dimorphism and polymorphism.
2. Mimicry, including concealment, protective devices and warning coloration.
3. Architecture of insect structures.
4. Relation of insects to plant fertilization and its importance.
5. Insect products of value to man.
6. Geographical distribution and methods of distribution of insects, with a consideration of life zones, barriers, etc.
7. Insect migrations.
8. Insect behavior and experimental entomology.
9. Enemies of insects.

140. ECONOMIC ENTOMOLOGY. — 1. Control methods.
2. Insect photography and methods of preparing illustrations.
3. Field work and life history investigations with methods for keeping records.
4. Legislation about insects.
5. Studies of insecticides and their application.

160. SYSTEMATIC ENTOMOLOGY. — 1. History of entomology and of classifications.
2. Lives and works of prominent entomologists.
3. Abundance of insects.
4. Important collections, public and private; their location and their value.
5. Types of insects; their significance, importance and location.
6. Rules of nomenclature and how they are used.
7. Methods for collecting, preparing, preserving and shipping insects.

180. SEMINAR. — Readings and reports on the current literature of entomology; monthly meetings.

190. COLLATERAL READINGS. — The best articles on the various topics in entomology are assigned for collateral readings, and are included in the final examinations.

200. THESIS. — Original research on one or several topics in morphology, ecology, economic and systematic entomology. This is expected to require from one-half to three-quarters of the total working time of the student.

MINOR REQUIREMENTS.

Minor courses will cover such parts of the work outlined above as will be most likely to prove useful in connection with the majors taken by the students, or in their future work. It is not required that such men shall have had all the undergraduate work in entomology given at this college, their credit for a minor beginning where their own undergraduate training in the subject ended.

Horticulture.

Graduate work is offered in various lines of horticulture. For the most part this is divided into the different departments which constitute the college Division of Horticulture, as follows: pomology, floriculture, landscape gardening, forestry and market gardening. For work in these lines application should be made direct to the heads of the several departments.

Besides this work, however, opportunity is offered for graduate study in general horticulture, including topics from the several organized departments mentioned, and also questions relating to plant breeding, general evolution, propagation, manufacture of horticultural products, etc. This general work is under the direction of Professor Waugh, head of the Division of Horticulture.

Landscape Architecture.

MAJOR REQUIREMENTS.

For the Degree of Master of Landscape Architecture.

PREREQUISITE WORK. — The undergraduate courses in the college known as Landscape Gardening 50, 51 and 52, Drawing 25, 26 and 27, Horticulture 50 and 51, and Mathematics 26 and 27 will be considered prerequisite to graduate work, and any student who has not passed these courses, or their equivalent, will be required to make up such work without graduate credit.

REQUIRED WORK. — Each student before he may receive the master's degree with a major in this department must convince his instructors that he has a genuine aptitude for some branch of landscape gardening, either in design, construction or management.

The minimum period of graduate study will be one and one-half years. At least one year of this time must be spent in residence at the college. One year must also be spent in practice outside the college. The work done outside the college may be prescribed by the department, and must be fully reported to the department in writing. It is essential, further, that the candidate secure the written approval of his employers outside the college. The department may, at its discretion, require a longer period of study at the college or a longer apprenticeship outside the college.

Every student before receiving his master's degree in landscape architecture must have given some thorough and fruitful study to each of the following five departments. As far as possible these studies must be of a practical nature, *i.e.*, they must be made upon actual projects in progress of development.

1. *Theory.* — The principles of esthetics as applied to landscape architecture.

2. *Design.* — The principles of pure design and their application in landscape and garden planning.

3. *Construction.* — The practical methods of carrying out landscape plans, laying out, equipment, organization of working force, time and cost keeping, etc.

4. *Maintenance.* — Methods, organization, cost.

5. *Practice.* — Office work, drafting, estimating, reporting, charges, accounting.

While great freedom is allowed to graduate students in their plans of work, a certain portion of time will always be given to systematic courses of instruction. Courses known as Landscape Gardening 175, 176, 177, 178, 179, 180, 181 and 182 are required, and may or may not be accepted for graduate credit, at the discretion of the department.

GRADUATE COURSES OFFERED.

175. THEORY OF LANDSCAPE ART. — Same as Landscape Gardening 75. First term. Credits, 3.
Professor WAUGH.

176. CIVIC ART. — Same as Landscape Gardening 76. Second term. Credits, 4.
Professor WAUGH.

177. COUNTRY PLANNING. — Same as Landscape Gardening 77. Third term. Credits, 4.
Professor WAUGH.

178. ARCHITECTURE. — Same as Landscape Gardening 78. Third term. Given in alternate years. Credits, 3.
Assistant Professor HARRISON.

179. CONSTRUCTION. — Same as Landscape Gardening 79. Third term. Given in alternate years. Credits, 3.
Assistant Professor HARRISON.

180. THEORY OF DESIGN. — Same as Landscape Gardening 80. First term. Credits, 4.
Professor WAUGH.

181. ESTATE DESIGN. — Same as Landscape Gardening 81. Second term. Credits, 4.
Assistant Professor HARRISON.

182. PARK DESIGN. — Same as Landscape Gardening 82. Third term. Credits, 4.
Assistant Professor HARRISON.

190. THEORY. — Special studies. Credits, 2-10.
The DEPARTMENT.

191. DESIGN. — Individual problems by arrangement. Credits, 2-10.
The DEPARTMENT.

192. CONSTRUCTION. — Individual problems by arrangement. Credits, 2-10.
The DEPARTMENT.

193. MAINTENANCE. — Special studies, experimental work or assigned problems. Credits, 2-10.
The DEPARTMENT.

194. PRACTICE. — Professional field work under supervision. By arrangement.
Credits, 2-10.
The DEPARTMENT.

195. SEMINAR. Credits, 1-5.
Professor WAUGH.

200. THESIS. — Each student before receiving the master's degree with a major in landscape architecture must present a satisfactory thesis or complete project. A thesis will consist of a careful original study of some problem in landscape architecture, presented in typewritten form with any necessary illustrations, such as photographs, diagrams, drawings, etc. A project will consist of a completed set of studies of some suitable landscape-gardening problem, such as the design of a park, a real estate subdivision, an extensive playground. Such a project will usually consist of —

- (a) Original surveys, including topography.
- (b) Block plans, showing original design.
- (c) A rendered plan or plans of the main features.
- (d) Detailed working drawings.
- (e) Estimates of cost.
- (f) Complete report and letter of transmittal.

Credits, 5-20.

MINOR REQUIREMENTS.

Any student electing a minor in landscape architecture will be directed to take such courses from the regular catalogue list as may seem most suitable to him. Under ordinary circumstances no other work will be given to students electing minors. In special cases, however, individual problems will be assigned and individual instruction given. These exceptions will be made in cases where, by so doing, it is possible to give the student material assistance in the plan of his major work.

Microbiology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidate must have had Courses 50, 51, 52, 80, 81, 82 and 83, or their equivalents, before he can enter upon graduate work.

REQUIRED WORK. — Studies will be selected from the courses offered below. It will be the purpose of the department to distribute such studies among the courses offered in a manner to gain the greatest efficiency and a comprehensive knowledge of the entire field. The work will be conducted by prescribed readings, critical written reviews, conferences, lectures and laboratory exercises.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — Courses of a basic and applied character selected from the courses offered below which will prepare the student for effective effort.

GRADUATE COURSES OFFERED.

100. HISTORY OF MICROBIOLOGY. Credits, 5-10.

110. CYTOLOGICAL AND MORPHOLOGICAL STUDIES AND CORRESPONDING TECHNIQUE. Credits, 5-10.

120. STUDIES IN TECHNIQUE AND METHODS. Credits, 5-20.

130. PHYSIOLOGICAL STUDIES. Credits, 5-20.

135. INDUSTRIAL FERMENTATIONS.	Credits, 5-10.
140. AGRICULTURAL MICROBIOLOGY — GENERAL SURVEY.	Credits, 5-20.
141. MICROBIAL STUDIES IN AGRICULTURE.	Credits, 5-10.
150. SOIL MICROBIOLOGY.	Credits, 5-20.
160. DAIRY MICROBIOLOGY.	Credits, 5-20.
170. FOOD MICROBIOLOGY.	Credits, 5-20.
180. HYGIENIC MICROBIOLOGY.	Credits, 5-20.
181. SPECIAL SANITARY OR HYGIENIC STUDIES.	Credits, 5-10.
190. LECTURES AND STUDY OF LITERATURE.	Credit, 1 each term.
200. THESIS. — Some microbiological problem related to agriculture or food. Distributed as may be most beneficial for research work. Time and credit by arrangement.	
	Credits, 15-50.

MINOR REQUIREMENTS.

Minor work in microbiology may consist of undergraduate Courses 50, 51, 52, and other courses designed to support the major work, from among the courses offered above. The candidate will also be required to pursue graduate Course 190, or follow a course of reading and conferences through three terms. In case the candidate has had some of these courses, he will be required to take more advanced substitute courses.

Pomology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had the equivalent of the courses required for graduation from this college; also sufficient practical experience to enable them to understand and appreciate the problems of orchard practice.

REQUIRED WORK. — The work outlined below will be required of all candidates.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — One-half of the work outlined below, selected to meet the needs of the individual student, will be required.

GRADUATE COURSES OFFERED.

101. EXPERIMENTAL METHODS.	Credits, 15-20.
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A critical study of the methods of research that have been used or may be helpful in pomological work. The following topics will be considered from the point of view of the investigator in pomology.

1. Statistical methods.
2. Measures of growth and yield.
3. The conduct of plot experiments.
4. Methods of soil study in their relation to pomological research.
5. Chemical methods of pomological research.
6. Methods of physiology applicable to fruit plants.
7. Microchemistry.

102. POMOLOGICAL RESEARCH.

Credits, 15-20.

A critical survey of past and current research work in pomology. Semi-weekly meetings for reports and discussions will be held. The following topics will be taken up.

1. Orchard soil management.
2. Soil fertility and fertilizers.
3. Physiology of pruning tree fruits and bush and vine fruits.
4. Fruit bud differentiation.
5. Sterility and fertility.
6. Genetics of fruit plants.
7. Climatology and winter injury.
8. Advanced morphology.
9. Spraying machinery and equipment.
10. Special practices.

103. ADVANCED LABORATORY WORK.

Credits, 5-12.

Each student will be required to become familiar with the research work of the department and to have a share in it. So far as this has value as graduate work he will receive credit.

104. HISTORY OF POMOLOGY.

Credits, 2-5.

The men, institutions and other influences that have contributed to the development of the science and art of pomology.

105. HORTICULTURAL TAXONOMY.

Credits, 2-3.

A study of the history and development of plant classification with special reference to horticultural plants. A study of modern classification carries with it an expression of opinion as to the evolution of cultivated plants.

106. ADVANCED SYSTEMATIC POMOLOGY.

Credits, 6-10.

The principles of systematic pomology including a study of nut and subtropical fruits not usually dealt with in undergraduate courses.

200. THESIS.

Credits, 40-50.

Each student will be required to carry out an original investigation of an assigned problem. In the planning, executing and interpreting the data of this problem he must show marked ability. The results are embodied in a thesis to be passed upon by the Department and the Graduate Staff.

MINOR REQUIREMENTS.

Students taking a minor in pomology will select such of the above courses as may be suited to their needs. Certain advanced undergraduate courses may also be taken for minor credit.

Poultry Science.

MAJOR REQUIREMENTS.

For the Degree of Master of Science or Master of Agriculture.

PREREQUISITE WORK. — The postgraduate course presupposes all undergraduate work or its equivalent, together with practical experience. Without the latter, students will be unable to handle Courses 140, 150 and 160. At the discretion of the instructor in charge, graduate students may be required to pursue undergraduate courses in other departments without credit.

REQUIRED WORK. — All the courses listed below. Practical poultry work may be required, but no credit will be given for such work.

GRADUATE COURSES OFFERED.

101. READING. — A review of the entire field of poultry literature, covering books, bulletins and special articles, is made, and a written report on one or more subjects required.

110. SEMINAR. — A critical review and a criticism of the more important experiments carried on at various stations in this and other countries; also a study of poultry conditions in foreign countries, methods of management, etc., besides a detailed study of some of the largest poultry projects in this country.

120. ANATOMY (GROSS AND HISTOLOGICAL), PHYSIOLOGY AND SURGERY. — This course requires a careful study of the anatomy and physiology of the fowl. Special attention is given to a study of those structures concerned with practical poultry problems. Instruction in surgical technique, adapted to fowls, may also be given.

130. BREEDING. — The student will carry on such breeding experiments as time and facilities permit. He may also do work in connection with our regular experimental projects. A detailed study of the pertinent literature will be required. Animal Husbandry 5, or its equivalent, is a prerequisite.

140. FEEDING. — A study of the relation of various foods and other substances to the morphology and physiology of the bird, with special reference to such subjects as egg production, feather form and structure, condition of flesh, bone, etc.

150. BROODING. — Studies will be made upon the relation between viability and rate of growth and the following topics: type of brooder, number of chicks in brood, ventilation, humidity, sanitation, exercise and weather conditions; also a comparison of natural methods with artificial methods of rearing chicks.

160. INCUBATION AND EMBRYOLOGY. — A number of problems of a practical, scientific and mechanical nature relating to incubation are considered. The work in embryology is of an advanced nature, dealing with its relation to morphogenesis and heredity, and presupposes an elementary knowledge of the embryology of the chick.

170. POULTRY DISEASES AND SANITATION. — In this course a study is made of various problems in poultry sanitation, with particular reference to methods relating to the control and eradication of disease.

200. THESIS.

MINOR REQUIREMENTS.

Courses 101 and 110 are designed particularly for minors.

Rural Sociology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must present satisfactory evidence of having completed at least 10 credit hours in general sociology and 10 credit hours in general economics; or take such undergraduate courses as the department may designate to satisfy this requirement.

REQUIRED WORK. — Candidates must take or pass by satisfactory examination courses offered by the department for undergraduates bearing the numbers 26, 50, 51, 52 and 75, and such courses in agricultural education and agricultural economics as may be required, not to exceed 10 credit hours in each department.

Candidates will be required to select from the courses listed below as graduate courses a field for investigation and intensive study. Candidates for the doctorate must take all courses listed as graduate.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — Not less than 50 credit hours will be required from the courses listed below. The department will make such selection as may best meet the interest of the individual student.

GRADUATE COURSES OFFERED.

177. FIELD WORK OF AN INVESTIGATIONAL NATURE.

178. RURAL SOCIAL SURVEYS.

179-181. SEMINAR.

182. SOCIAL CONDITIONS OF AMERICAN RURAL LIFE.

183. SOCIAL CONDITIONS OF EUROPEAN RURAL LIFE.

184. RURAL INSTITUTIONS.

185. RURAL ORGANIZATION.

186. FARMERS' ORGANIZATIONS.

187. TOWN AND VILLAGE RURAL LIFE.

188. RURAL HEALTH AND SANITATION.

189. RURAL LITERATURE.

190. RURAL GOVERNMENT AND LAW.

200. THESIS.

Veterinary Science.

Work is available in hygiene, veterinary pathology, and other special lines or divisions of the subject.

Zoölogy.

MINOR REQUIREMENTS.

Courses in zoölogy may be available as a minor for the degrees of doctor of philosophy and master of science. The nature of the work will necessarily vary according to circumstances, and may be intensive in a special field and correlated closely with the major work of the student, or it may be of a more general character, depending on the student's needs or previous acquaintance with general zoölogical science.

THE SHORT COURSES.

The short courses offered by the Massachusetts Agricultural College are designed to meet the needs of those, both young and old, who cannot come to the college for the regular college courses. They furnish the student with instruction in modern accepted methods, and are planned to help the farmer and the housewife.

The short courses include: —

- A. The Two-year Course in Practical Agriculture.
- B. The Ten Weeks' Winter School.
- C. The Summer School.
- D. The Vocational Poultry Course.

REQUIREMENTS FOR ADMISSION TO SHORT COURSES. — Students must be at least seventeen years of age, and must furnish satisfactory evidence of good moral character. References are required. There are no entrance examinations. The sole test is ability to do the prescribed work. Students enrolling for the Two-year Course in Practical Agriculture must have at least a common school education.

EXPENSES OF SHORT COURSES. — The expense of attending any of the short courses is approximately as follows: —

Furnished rooms in private houses (per week)	. . .	\$3 to \$5
Board at college dining hall (per week)	. . .	\$7
Board with private families (per week)	. . .	\$6.50 to \$9
Registration fee (Ten Weeks' Winter School)	. . .	\$5

Tuition in all the short courses is free to residents of the Commonwealth. Small laboratory fees are charged in some of the courses.

A. TWO-YEAR COURSE IN PRACTICAL AGRICULTURE.

The Two-year Course in Practical Agriculture is offered to meet the needs of students who for one reason or another cannot take the four-year college course. It is designed to provide a large amount of practical information and training in agriculture and horticulture.

It will appeal, not only to young men and women, but also to men and women of mature years and practical experience who wish to know more about the business of farming. Although the course is planned to meet the needs of those who are not graduates of high schools, the instruction is not preparatory or elementary in its nature, but is so planned that it will be of value to all. The greater amount of academic training that some of the students may possess will in a measure be offset by the fund of practical knowledge possessed by many who have completed only the elementary schools.

The course is not intended for students enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools who wish to take the course should bring a statement either from the principal of the high school or from parent or guardian asking permission to be enrolled.

The Two-year Course in Practical Agriculture is arranged so as to provide specific vocational training for the particular lines of agricultural work which the students may select. When a student enrolls he is required to state the type of

farming in which he expects to engage; and to select from the following courses of study the one he wishes to pursue:—

1. General agriculture, with animal husbandry as the principal subject.
2. General agriculture, with poultry as the principal subject.
3. Dairy manufactures.
4. General horticulture.
5. Pomology.
6. Floriculture.
7. Vegetable gardening.

He then pursues a specially arranged course of preparation for that type of work. This specialization does not prevent his securing a general working knowledge of other subjects in which he may be interested.

The advantages of the college staff of specialists and the college plant with all its resources are thus made available to young men and young women who may not have had the opportunity of securing a high school education.

The first year consists of six months of study at the college. The term begins with the college fall term and closes with the winter term of the regular session. The same vacation periods are observed as in the regular four-year course.

At the close of six months of study, students are required to gain six months of farm experience. The college will assist students in finding positions and in placing them on farms where the experience gained will be of great advantage. Thus an effort will be made to place on a dairy farm the man expecting to take up dairying as his chief line of work, and a student of pomology on a fruit farm.

During the second year the student spends nine months in resident study, completing the subject pursued in the first year.

Each student is required to file with the treasurer of the college a statement, signed by the town (or city) clerk of the town (or city) from which he enrolls, stating that the parent or guardian of the student is a resident of that town.

CERTIFICATE.—Students completing satisfactorily work prescribed in the Two-year Course will receive certificates.

Credits earned in the Two-year Course in Practical Agriculture or in any other of the short courses except the Summer School, do not lead to the college degree.

TUITION.—Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$60 a term.

B. THE WINTER SCHOOL.

The Winter School, beginning usually about January 1 and continuing for ten weeks, was started several years ago, and has always been very popular, not only with more mature farmers and their wives, but with young men and women who control or manage farms. The courses, though short, are very practical in their nature, and are so arranged that a student may choose such subjects as will enable him to specialize along the line of work in which he is most interested. There is a wide range in the choice of subjects, making it possible for the student to take work for several winters in succession. Many college graduates enroll for the Winter School.

SCHOLARSHIPS.—The Jewish Agricultural and Industrial Aid Society of New York has instituted a system of free scholarships to enable the children of Jewish farmers to attend the short winter course in the States in which they reside. The stipend is sufficient to pay all the expenses of the holder for the course. Such expenses usually amount to from \$100 to \$150. The following courses are offered:—

OUTLINE OF THE TEN WEEKS' WINTER SCHOOL, JANUARY 2 TO MARCH 10.

Soil Fertility. Three lectures a week.

Field Crops. Two lectures and one two-hour laboratory period per week.

Types and Breeds of Livestock. Three lectures and two two-hour laboratory periods a week.

Livestock Feeding. Three lectures per week.
 Animal Breeding. One lecture and one two-hour laboratory period per week.
 Dairying. Five lectures and five laboratory periods per week.
 Dairy Bacteriology. Two lectures and one two-hour laboratory period per week.
 Animal Diseases and Stable Sanitation. Two lectures per week.
 Poultry Husbandry. Five lectures and one two-hour laboratory period per week.
 Fruit Growing. Three lectures and one two-hour laboratory period per week.
 Market Gardening. Three lectures and two two-hour laboratory periods per week.
 Floriculture. Five lectures per week.
 Horticultural Manufactures. Two lectures and two laboratory periods per week.
 Farm Management. Two lectures a week.
 Farm Accounts. Two two-hour laboratory periods per week.
 Marketing. Two lectures a week.
 Agricultural Credit. Two lectures a week.
 Botany. Two lectures a week.
 Entomology. Three lectures per week.
 Farm Structures. Two lectures and one two-hour laboratory period per week.
 Farm Machinery. Two lectures and three two-hour laboratory periods a week.
 Rural Sanitary Science and Hygiene. Two lectures per week.
 Vocational Guidance. One lecture per week.
 Foods. One lecture and two two-hour laboratory periods per week.
 The Business of the Household. Three class hours per week.
 Home Care of the Sick. Three class hours per week.
 Principles and Methods of Vocational Agricultural Teaching. Five exercises per week.
 Special Methods in Vocational Agricultural Teaching. Five exercises per week.
 Professional Improvement Problems. Five periods per week.

C. THE SUMMER SCHOOL.

The Summer School has been maintained by the college for a number of years. The experience of these years has been a value in arranging short, intensive, practical courses that will meet the needs of teachers, home makers and professional workers who wish instruction in agriculture, agricultural education and home economics, and who can most conveniently come to the college during the summer. The instruction is given by the regular members of the college staff, assisted by outside lecturers. The term period is six weeks.

College credit is now offered for work in the Summer School. For teachers and other students interested in professional improvement, or working for degrees, this change is especially valuable.

While agricultural courses were not presented during the past summer, if a demand develops for such work, it will be included in the program.

The nature of the work of the Summer School is indicated by the following typical program:—

Agriculture and horticulture:—

Poultry husbandry
 Fruit growing
 Flower growing
 Vegetable gardening
 Food preservation
 Beekeeping

Home economics:—

Foods and nutrition
 Preparation and serving of meals
 Garment making
 Dress design and construction
 Millinery
 House furnishing
 Home management

Related subjects:—

Insect life
 Bird life

Related subjects—*Concluded.*

Recreation
 Dramatic presentation
 Design and practical arts
 Rural sociology
 Hygiene and sanitation
 General science
 Public health

Agricultural education:—

Principles and methods of teaching
 Special methods in vocational agricultural teaching
 Professional improvement problems
 Supervision and administration of agricultural education
 Vocational education
 Educational psychology
 Mental tests

Special courses for students deficient in college entrance are offered in the following subjects: —

Preparatory algebra.
College entrance English.
Plane geometry.

D. ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY.

PURPOSE. — This course is designed for graduates of the agricultural vocational schools and others who wish to prepare themselves for practical poultry keeping, and can spend only one year at college.

SCOPE. — The work covers seven detailed courses in poultry husbandry, as well as short-course work in fruit growing, market gardening, animal husbandry, or other subjects that will be helpful to poultry raisers. In addition to classroom and laboratory exercises each student is required to put in from eight to ten hours per week at the plant in the care and management of poultry, for the purpose of becoming proficient in the various branches of the work.

ENTRANCE REQUIREMENTS. — Applicants must be at least eighteen years of age and have a good elementary education.

FEES. — There is no tuition for residents of Massachusetts, but a laboratory fee of \$5 is required for both the fall and spring terms.

NOTE. — The course is limited to sixteen students. The One-year Poultry Course begins at the beginning of the winter term and continues until the following December.

GENERAL INFORMATION.

A. FINANCIAL AND ADMINISTRATIVE.

Student Expenses.

TUITION.¹ — Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$180 a year. Students entering from Massachusetts are required to file with the president a statement signed by either town or city clerk stating that the applicant's father is a legal resident of Massachusetts.

All students entering the college for the first time as undergraduates or two-year students are charged a matriculation fee of \$5, which in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the diploma.

DORMITORIES AND BOARD. — The college has dormitory accommodations for about 62 men students. The rooms in the dormitories are occupied by the upper classmen, hence new students find it necessary to room in private houses. The rooms in the college dormitories are unfurnished; for the most part they are arranged in suites of three, — one study room and two bedrooms. These rooms are heated by steam and lighted by electricity; they are cared for by students occupying them. The dormitory rent for each person varies from \$39 to \$66 a year. The rent for furnished rooms in private houses ranges from \$1 to \$4 a week for each occupant. Correspondence in regard to rooms should be addressed to the dean of the college.

Board may be obtained at the college dining hall. At present, the price of board there is \$7 a week.

Expenses.

The necessary college expenses are estimated as follows: —

Tuition: citizens of Massachusetts, free; others, \$180 per year.

	Low.	High.
Matriculation fee, first year	\$5 00	\$5 00
Room in college dormitories or in private houses	39 00	110 00
Board, \$7 per week	45 00	45 00
Laundry, 50 to 85 cents a week	18 00	30 00
Laboratory fees	5 00	25 00
Books, stationery and miscellaneous items	38 00	60 00
	\$350 00	\$475 00

OTHER EXPENSES. — Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is also assumed by students joining a fraternity or entering into other social activities of the college. Students rooming in college dormitories are obliged to equip their own rooms with furniture. The college assumes no responsibility in regard to the safe keeping of student property either

¹ This statement applies to those registering as regular or two-year students.

during the college term or vacations, except under such special arrangement as may be made with the treasurer. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$400 and \$500 per year.

INITIAL CHARGES.

At the opening of the college year, before students are registered in their classes, the following charges are payable at the treasurer's office:

	Freshmen.	Sophomores.	Juniors and Seniors.
Matriculation fee	\$5 00	—	—
Board (if at college dining hall) four weeks in advance	28 00	\$28 00	\$28 00
Assessment for support of Social Union	1 50	1 50	1 50
Laboratory fees	5 00	5 00	2 00-10 00
Room rent (if in college dormitory)	—	—	12 00-20 00
Student tax for support of athletics ¹	5 00	5 00	5 00
Student tax for support of nonathletic activities ¹	3 00	3 00	3 00

¹ While this is not essentially a college charge, the treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers; the amount of athletic tax by vote of the student body.

LABORATORY FEES.

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present, the fees charged are as follows:

Agronomy:	Per Term.	Rural engineering:	Per Term.
Course 27	\$2 00	Course 75	\$1 50
Course 50	2 50	Course 78	1 50
Course 51	2 50		
Course 75	2 00	Floriculture:	
Course 77	2 50	Course 50	2 50
Course 78	2 50	Course 51	2 50
		Course 52	2 50
Animal husbandry:		Course 53	2 50
Course 25	1 50	Course 55	2 50
Course 26	1 50	Course 75	2 00
Course 75	1 50	Course 76	2 00
		Course 77	2 50
Dairying:			
Course 50	3 00	Forestry:	
Course 51	3 00	Course 56	2 00
Course 75	3 00	Course 57	3 00
Course 76	3 00	Course 58	4 00
Course 77	3 00		
Farm management:		Landscape gardening:	
Course 75	1 50	Course 50	2 50
		Course 51	2 50
Poultry husbandry:		Course 52	2 50
Course 51	2 50	Course 76	3 00
Course 52	3 00	Course 77	3 00
Course 76	2 00	Course 80	3 00
Course 77	2 00	Course 81	3 00
		Course 82	3 00

Pomology:		Per Term.	Entomology — <i>Concluded.</i>		Per Term.
Course 54	.	\$4 00	Course 53	.	\$1 00
Course 75	.	4 00	Course 54	.	1 00
Vegetable gardening:			Course 55	.	1 00
Course 50	.	2 00	Course 75	.	2 00
Course 52	.	2 00	Course 76	.	3 00
Course 53	.	2 00	Course 77	.	3 00
Course 75	.	3 00	Course 78	.	3 00
Course 76	.	2 00	Mathematics and engineering:		
Drawing:			Course 27	.	1 50
Course 25	.	3 00	Course 78	.	1 50
Course 26	.	3 00	Microbiology:		
Course 27	.	3 00	Course 50	.	5 00
Botany:			Course 51	.	5 00
Course 3	.	1 50	Course 52	.	5 00
Course 25	.	1 50	Course 75	.	5 00
Course 26	.	1 50	Course 76	.	5 00
Course 50	.	2 00	Course 80	.	5 00
Course 51	.	2 00	Course 81	.	5 00
Course 52	.	2 00	Course 82	.	5 00
Course 53	.	2 00	Course 83	.	5 00
Course 54	.	2 00	Physics:		
Course 55	.	3 00	Course 27	.	3 00
Course 75	.	3 00	Course 50	.	3 00
Course 76	.	3 00	Course 51	.	3 00
Course 77	.	3 00	Course 52	.	3 00
Course 78	.	3 00	Veterinary science:		
Course 79	.	3 00	Course 78	.	2 00
Course 80	.	3 00	Course 79	.	2 00
Chemistry: ¹			Course 80	.	2 00
Course 1	.	3 00	Course 85	.	2 00
Course 2	.	3 00	Course 86	.	2 00
Course 4	.	3 00	Course 87	.	2 00
Course 5	.	3 00	Zoölogy:		
Course 25	.	4 00	Course 26	.	3 00
Course 26	.	4 00	Course 50	.	3 00
Course 30	.	3 00	Course 51	.	3 00
Course 51	.	5 00	Course 52	.	3 00
Course 52	.	5 00	Course 75	.	3 00
Course 62	.	5 00	Course 76	.	3 00
Course 80	.	4 00	Course 77	.	3 00
Course 86	.	5 00	Course 79	.	2 00
Course 91	.	5 00	Music (each course)		
Course 92	.	5 00		.	3 00
Course 93	.	5 00	Rural home life:		
Course 94	.	5 00	Courses 25, 27	.	1 50
Course 95	.	5 00	Courses 50, 51, 52	.	4 00
Entomology:					
Course 50	.	1 00			
Course 51	.	1 00			

¹ An additional deposit of \$1 for Courses 1 to 6, inclusive, and \$2 for Courses 25 to 95, will be required to cover individual breakage. In case the laboratory breakage does not equal the deposit, the balance will be refunded.

Rooms.

Students are expected, as far as possible, to occupy rooms in the college dormitories. Students who do not live in the college dormitories must secure rooms approved by the college. The assignment of rooms, and the general supervision of the housing of students, is in charge of the dean. At the end of each college year all unoccupied rooms will be thrown open for selection, and will be assigned to students according to classes.

Living Accommodations for Women Students.

Women students attending the college live in a dormitory provided for them, and take their meals at Draper Hall, which is located a short distance from the women's dormitory. The women's dormitory accommodates 98 girls, and is furnished. The present charge for room and board for women students is \$120 per term.

Student Aid.

SELF-HELP. — Many students are obliged to find work of some sort to earn their way through college. A few men have met their entire expenses in this manner, many more have paid a large part of their expenses, and many have earned a small proportion of the cost of their college education; but the college recommends that no new student enter without having at least \$200 and preferably \$300 with which to pay his way until he can establish himself in some regular work. The college does not encourage students to enter without money in the expectation of earning their way entirely. The ordinary student will find it better either to work and accumulate money before coming to college, or to take more than four years in completing his college course, or, instead, to borrow money sufficient to carry him through. No student should undertake work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

So far as possible needy students will be employed in some department of the college. The divisions of agriculture and horticulture usually afford the most work, although there are several permanent janitorships available for students, and forty or more students are employed at the dining hall.

Application for student labor should be made directly to Edward M. Lewis, acting president of the college. Students whose department or class work is not satisfactory are not likely to be continued in student labor. The most desirable and responsible positions are naturally assigned to those needy students who have been in the institution longest and who have demonstrated their need and ability. Students, therefore, may find it rather difficult to obtain all the work they desire during their freshman year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

SPECIAL NOTICE TO NEEDY STUDENTS. — In the last few years the demand for paid labor on the part of new students has far exceeded the amount of employment that the college can offer. The college cannot promise work to any student, particularly to freshmen; it accordingly urges prospective students who are dependent entirely upon their own efforts not to undertake the course before they have earned enough money to carry them through, or nearly through, the first year.

Scholarships.

THE WARD FUND.

The so-called Ward Fund is available for the assistance of needy boys from Hampshire County attending the Massachusetts Agricultural College. This fund is administered by a Board of Trustees not connected with the College. Application blanks for assistance from this fund may be secured from the Treasurer of the College.

THE FREDERICK G. CRANE FUND.

The family of the late Frederick G. Crane of Dalton has presented to the Massachusetts Agricultural College a gift of \$25,000 to establish a fund in memory of Frederick G. Crane, the income therefrom to be expended by the Trustees in aid of worthy undergraduate four-year students of limited financial resources attending the College, preference being given to residents of Berkshire County. Grants made from this fund are to be known as Frederick G. Crane Scholarships.

Applications.

All applications for loans or gifts from this fund should be made to the President, Massachusetts Agricultural College, Amherst, Mass., under whose direction an investigation will be made of the merits of the applicants. The purpose of this investigation will be to insure that the aid is extended to students whose parents are in such financial condition that assistance is necessary in order to insure a college education for the applicants; that it is extended only to students who propose to complete their college education at the Massachusetts Agricultural College; and that it is given to those whose character and scholarship record justifies the assistance available through this fund.

Aid to Freshmen.

Grants from the Crane Fund will be made to freshmen in the form of loans supported by notes bearing indorsements satisfactory to the President of the College. These notes will bear interest and will be negotiable. The College, however, will at its discretion cancel these notes at the end of one year if the scholarship record of the student, his character, and his plans for the future appear to the President so to warrant.

Aid to Sophomores.

Grants will be made to sophomores either on the plan outlined for freshmen as given above or on the plan outlined for juniors and seniors as given below.

Aid to Juniors and Seniors.

Grants to juniors and seniors will usually be in the form of gifts and will be awarded with consideration of the need, of the scholarship, and of the character of the applicant.

Amount of Grants.

The amount of grants from this fund, made either as loans or as gifts, will be determined by the need of the applicant and by the amount of money available in the fund. Generally one may expect to receive from \$50 to \$300 per year.

General Considerations.

In harmony with the provisions of the bequest, preference will be given to applicants for aid who reside in Berkshire County; but the cases of deserving students from other parts of the State will be given due consideration, and such students may under certain conditions be aided in preference to the residents of Berkshire County.

Awards will be made to girls and boys without discrimination.

Memorial Hall.

Soon after the close of the World War the alumni, students, faculty and friends of the college subscribed \$150,000 for the erection of a soldier memorial building to be placed on the college campus. This building was completed in the summer

of 1921. It is designed to serve as headquarters for the student activities, and as the center of the social life of the institution.

In the basement are bowling alleys, pool tables, a store, post office and barber shop. On the main floor are eight offices for leaders of various student activities, a large reading room, and a beautiful memorial room in which is found the tablet bearing the names of the sons of the college who gave their lives in the great war. On the second floor is an auditorium seating 350 persons. This room is also used for college dances.

Student Accounts.

The following rules are enforced concerning student accounts:

No student will be allowed to graduate until all bills due the institution from him are paid.

College charges, such as room rent, laboratory fees and tuition, must be paid in advance, at the beginning of each term. This rule is strictly adhered to, and no student will be allowed to complete his registration until such payments are made.

Every student boarding at Draper Hall is required to pay at the beginning of each term at least one month's board in advance; and no student will be allowed to continue to board at Draper Hall if at any time during the term he is more than one week in arrears in his payment for board.

All money due for student labor shall at the discretion of the treasurer of the college be applied on account toward any bills that a student may owe to the institution.

Honor Council.

All tests and examinations are conducted under the honor system, which is administered by an Honor Council chosen by the students. Recommendations for discipline are made to the President of the college by the Honor Council.

Student Relations.

The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standards of student deportment.

The privileges of the college may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right, not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences ("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

Infirmary.

The college maintains an infirmary for the care of sick or injured students.

The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this

kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students:—

MANAGEMENT OF THE INFIRMARY.

Supervision.

1. The infirmary is under the *general supervision* of Prof. Charles E. Marshall, who is designated as Supervisor of the Infirmary. A resident nurse is in *immediate* charge of the infirmary.

Use of Infirmary.

2. Students are urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

General Health.

3. Students are urged to consult the physical director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident.

General Fee.

4. The infirmary fee will be at the rate of \$2 a day, and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights. A nominal charge will be made to outpatients for miscellaneous treatment of a minor character.

Additional Expenses.

5. In addition to the fee charged, as specified in paragraph 4, the following additional expenses will be charged to the patient:—

(a) *Nurses.*— In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(b) *Professional Service.*— If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(c) *Supplies.*— Special medical supplies prescribed by a physician or nurse will be charged to the patient.

(d) *Laundry.*— Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

B. COLLEGE ACTIVITIES.

General Exercises.

Chapel exercises are held two mornings each week. On Thursdays during the fall term, and on Wednesdays during the winter and spring terms, an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is held during

the winter months. Students are required to attend these general exercises, although the president is authorized to excuse from chapel any student who may object to attendance thereon because of his religious scruples, provided his request for excuse therefrom is endorsed by his parent or guardian.

Student Activities.

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established in 1907. All students become members of the union by paying a small fee. In the fall and winter months the union gives a series of entertainments, free to students and faculty.

The College Senate is composed of representatives of the junior and senior classes. This body serves as a general director of undergraduate conduct, and represents before the faculty the interests of the student body.

The Young Men's Christian Association and the Young Women's Christian Association are active both socially and religiously. A Catholic club has also been organized.

Intercollegiate and intermural athletic contests are held throughout the year in the leading sports, including football, baseball, track, hockey and basketball. The athletic board, composed of alumni, faculty and students, has charge of finances, schedules, and general policies governing athletics.

The musical clubs include an orchestra and a glee club. These give a number of concerts, usually followed by dancing, during the year, both in Amherst and on tour. A dramatic club, The Roister Doisters, present annually a revue and two plays, one in connection with the promenade and the other at commencement. There are, besides the declamation and oratorical prize contests, both underclass and intercollegiate debates. The college is a member of a quadrangular league with Maine, New Hampshire, and Vermont. The college publications are the "Massachusetts Collegian," the weekly newspaper; "The Index," the year book; "The Squib," a comic magazine; and "The Alumni Bulletin," issued from the office of the alumni secretary. Judging teams under the direction of the departments of Animal Husbandry, Poultry Husbandry, and Pomology compete with teams from other agricultural colleges. The Academic Activities Board, composed of alumni, faculty and students, has charge of the finances, schedules, etc., of the various clubs and publications.

A rifle club has been organized for a few years. Teams representing this club have repeatedly won the intercollegiate championship of the country, both in indoor and outdoor contests.

C. ACADEMIC AND DEPARTMENTAL.

Degrees.

Those who complete a four-year course receive the degree of bachelor of science. The fee for graduation from the college is \$5.

Graduate students who complete the assigned courses will receive the degree of master of science upon the payment of a fee of \$10. Credit may sometimes be allowed towards this degree for teaching or other advanced work done in some department of the college.

Graduate students who complete the required three-year course of study, and present a satisfactory thesis, will be granted the degree of doctor of philosophy. The diploma fee in this instance is \$25.

Those to whom degrees are awarded must present themselves in person at commencement to receive them. No honorary degrees are conferred.

The honorary fraternity of Phi Kappa Phi has a chapter at the agricultural college. Students are elected to membership to this fraternity on the basis of scholarship. Elections are made from the highest tenth of the senior class who have attained an average grade of at least 85 per cent during their college course.

Awards and Prizes, 1924.

GRINNELL PRIZES. — The Grinnell prizes, given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq. of New York, to those members of the senior class who pass the best, second best and third best examinations, oral and written, in theoretical and practical agriculture, were awarded as follows: —

First Prize, Kenneth Wallace Sims.

Second Prize, Alfred Fullick Gay.

Third Prize, Luther Leonard Hayden, Jr.

PUBLIC SPEAKING. — The Burnham prizes were awarded to the students delivering the best and second best declamations, as follows: —

First Prize, Herman Eames Pickens.

Second Prize, Robert C. Ames.

FLINT PRIZES. — The Flint prize, awarded to the student delivering the best oration, as follows: —

No contest in 1924.

HILLS PRIZES. — The Hills Prizes for the best herbaria were awarded as follows: —

First Prize, John T. Perry.

Second Prize, Mrs. Mary T. Boyd.

SOUTHERN ALUMNI BASEBALL CUP. — For the best all-round Baseball player during the season of 1924 the Southern Alumni baseball cup was awarded to Arthur Chester Nicoll, 1924.

ALLAN LEON POND MEMORIAL MEDAL, FOR EXCELLENCE IN FOOTBALL. — The Allan Leon Pond memorial medal for general excellence in football was awarded to Sterling Myrick, 1924. This medal is in memory of Allan Leon Pond of the class of 1920, who died Feb. 26, 1920.

ATHLETIC PRIZE. — The trustees of the Frederick Cornelius Eldred Memorial Athletic Fund offered a prize of fifty dollars to that member of the senior class who showed the most constructive suggestions for the physical development of the student body, with particular reference to that portion which does not participate in the major sports. Awarded to Sterling Myrick, 1924.

DEGREES CONFERRED — 1924.

MASTER OF SCIENCE (M.Sc.).

Archibald, John Geddie, B.S.A., Ontario Agricultural College . . .	Amherst.
Bromley, Stanley Willard, B.Sc., Massachusetts Agricultural College . .	Southbridge.
Mack, Warren Bryan, B.Sc., Pennsylvania State College . . .	Flicksville, Pa.
Mooney, Raymond Alson, B.Sc., Massachusetts Agricultural College . .	Plattsburg, N. Y.

MASTER OF LANDSCAPE ARCHITECTURE (M.L.A.).

Rogers, Roland Winsor, B.Sc., Massachusetts Agricultural College . . .	Amherst.
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DOCTOR OF PHILOSOPHY (Ph.D.).

Freeborn, Stanley Barron, B.Sc., Massachusetts Agricultural College . .	Berkeley, California.
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BACHELOR OF SCIENCE (B.Sc.).

Barrows, Robert Arthur	Quincy.
Bartlett, Frederick Sheldon	Westfield.
Bartlett, Perry Goodell	Holyoke.
Bartlett, Warren Leslie	Boston.
Belden, Clifford Luce	Bradstreet.
Bike, Edward Louis	Westfield.
Bittinger, Richard	Northfield.
Bowes, Charles Atwell	Worcester.
Brunner, Fred, Jr.	Cranbury, N. J.
Burbeck, Joseph Howard	Peabody.
Cahalane, Victor Harrison	Charleston, N. H.
Carpenter, Earle Stanton	Rehoboth.
Chase, Theodore Martin	Livermore Falls, Me.
Cromack, Earl Augustus	Shelburne Falls.
Darling, Robert Martin	Cambridge.
Davis, Howard Halsey	Brockton.
Deuel, Charles Frederick, 2d.	Amherst.
Dresser, Allen Lucius	Amherst.
Elliott, James Alexander	Summit, N. J.
Epps, Martha Belle Scott	Winchendon.
Fenton, John Michael	Amherst.
Fernald, Leland Hoyt	Arlington.
Flint, Ruth Guild	Allston.
Foley, Mary Joanna	Worcester.
Frost, Sherman Clark	Cambridge.
Gadsby, James Herbert	North Adams.
Garretson, Alfred Corwin	Bound Brook, N. J.
Gay, Alfred Fullick	Groton.
Geiger, Aimee Suzanne	Pepperell.
Goldsmith, Eliot Gray	Brookline.
Goldstein, Joseph	Lynn.
Grieve, Alexander Watson	Dorchester.
Gryzwacz, Patrick Louis	Ware.
Haskell, Malcolm Rawson	Amherst.
Hayden, Luther Leonard, Jr.	Brookville.
Hescock, Robert Eddy	Amherst.
Hill, Carroll Victor	Worcester.
Holway, Clarence Warren	Putney, Vt.
Isaac, Carl Frederick	Brighton.
James, Locke LeBaron	West Bridgewater.
Kane, Edward Anthony	Westfield.
Keith, Clifford Woodworth	East Providence, R. I.
King, Rosewell Howard	Millville.
Lamb, Eric Franklin	Waban.
Lane, Wilfred Craig	Fitchburg.
Leland, Allen Sanford	East Bridgewater.
Loring, Kenneth Stockwell	Melrose Highlands.
MacAfee, Norman Hoar	Cambridge.
Meserve, Charles Arthur	Amherst.
Morris, Walter Markley	Amherst.
Myrick, Sterling	Longmeadow.
Nelson, Carl Olaf	Gloucester.
Nicoll, Arthur Chester	Quincy.
Norwood, Howard Lester	Boston.

REGISTRATION, 1924-25.

AS OF NOVEMBER 1, 1924.

GRADUATE STUDENTS.

Ayers, Theodore T.	Old Forge, Pa.
B.Sc., Pennsylvania State College.	
Bailey, John S.	Amherst.
B.Sc., Michigan Agricultural College.	
M.Sc., Iowa State College.	
Bartlett, Frederick S.	Westfield.
B.Sc., Massachusetts Agricultural College.	
Bird, Arthur C.	Waterbury, Conn.
B.Sc., Connecticut Agricultural College.	
Cassidy, Morton H.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Chase, Eleanor F.	Amesbury.
B.Sc., Massachusetts Agricultural College.	
Cupery, Martin E.	Friesland, Wis.
A.B., Hope College.	
Dickinson, Lawrence S.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Doran, William L.	Lexington.
B.Sc., Massachusetts Agricultural College.	
M.Sc., Massachusetts Agricultural College.	
Foley, Mary J.	Amherst.
B.Sc., Massachusetts Agricultural College.	
French, Arthur P.	Amherst.
B.Sc., Ohio State University.	
M.Sc., Massachusetts Agricultural College.	
Garabedian, Hovanes	Smyrna, Asia Minor.
B.A., International College, Smyrna.	
Garvey, Mary E. M.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Gibbard, James, Jr.	Toronto, Ontario, Canada.
B.S.A., Ontario Agricultural College, Toronto University.	
Gilligan, Gerald M.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Gray, T. Davis	Morgantown, West Va.
B.Sc., Maryland Agricultural College.	
Grieve, Alexander W.	Dorchester.
B.Sc., Massachusetts Agricultural College.	
Hallowell, Elizabeth	Amherst.
A.B., A.M., Boston University.	
Hays, Frank A.	Amherst.
B.Sc., Oklahoma A. & M. College.	
M.A., University of Nebraska.	
Ph.D., Iowa State College.	
Hopkins, Elizabeth F.	Canandaigua, N. Y.
A.B., Vassar College.	
Jones, Willard P.	Amherst.
B.Sc., University of Wisconsin.	
Louwsma, Henry	Zeeland, Mich.
A.B., Hope College.	
McDonnell, Anna H.	Florence.
A.B., Smith College.	
Mayo, William I., Jr.	Northampton.
B.Sc., Massachusetts Agricultural College.	
Merritt, Lucius A., Jr.	Williamsburg.
B.Sc., Trinity College.	
Morgan, Ezra L.	Columbia, Mo.
A.B., McKendree College.	
M.A., University of Wisconsin.	
Mortensen, Harry T.	Rodney, Mich.
B.Sc., Michigan Agricultural College.	
Muller, Richard T.	Amherst.
B.Sc., Cornell University.	
M.Sc., University of Maine.	
Patch, Henry L.	Wenham.
B.Sc., Massachusetts Agricultural College.	
Patton, John W.	Amherst.
D.V.M., Texas A. & M. College.	
M.Sc., Kansas State College.	
Pendleton, Harlow L.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Percival, Gordon P.	Medfield.
B.Sc., Massachusetts Agricultural College.	

Prescott, Glenn C.	Florence.
B.A., University of Maine.	
Pulley, Marion G.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Raleigh, George J.	Amherst.
B.Sc. in Agr., Kansas State Agricultural College.	
M.Sc., University of Nebraska.	
Redman, Ralph W.	Amherst.
B.Sc., University of Maine.	
Reed, James P.	Hadley.
B.Sc., University of Vermont.	
Rice, Victor A.	Amherst.
B.Sc., North Carolina State College.	
M.Agr., Massachusetts Agricultural College.	
Rikert, Carroll	Mount Hermon.
B.A., Harvard University.	
Ring, Gordon C.	Amherst.
B.Sc., M.A., Wesleyan University.	
Rowell, Elwyn J.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Sanborn, Joseph R.	North Amherst.
B.Sc., Massachusetts Agricultural College.	
Sanborn, Ruby	Amherst.
A.B., Mount Holyoke College.	
Sawtelle, Donald W.	Amherst.
B.Sc., University of Maine.	
M.Sc., University of Wisconsin.	
Sawtelle, Emily H.	Amherst.
B.A., M.A., New York State College for Teachers.	
Sessions, Alwyn C.	Logan, Utah.
B.Sc., Utah Agricultural College.	
Seymour, Frank C.	North Amherst.
A.B., Harvard University.	
B.D., Union Theological Seminary.	
Shepard, Harold H.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Simmons, Kenneth B.	Rowesville, S. C.
B.Sc., Clemson College.	
Smith, Richard W., Jr.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Snyder, Grant B.	Amherst.
B.S.A., Ontario Agricultural College.	
Steck, Harold W.	Bethel, Conn.
B.Sc., Connecticut Agricultural College.	
Street, Orman E.	Reville, S. Dak.
B.Sc., South Dakota State College.	
Sumbarido, Alexander H.	Seattle, Wash.
B.Sc. in Agr., Washington State College.	
Van Meter, Ralph A.	Amherst.
B.Sc., Ohio State University.	
Waugh, Albert E.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Wharton, Denis R. A.	Port of Spain, Trinidad.
B.S.A., Ontario Agricultural College.	
Willard, John D.	Amherst.
B.A., Amherst College.	
Wofford, Gus C.	Laurens, S. C.
B.Sc., Clemson College.	
Worthley, Harlan N.	Amherst.
B.Sc., M.Sc., Massachusetts Agricultural College.	
Yaxis, T. George	Amherst.
B.Sc., New Hampshire State University.	
M.Sc., Cornell University.	
Yount, Hubert W.	Amherst.
B.Sc.Agr., Ohio State University.	
M.Sc., Massachusetts Agricultural College.	

Registered after the Catalogue for 1923 was published.

Ayers, Theodore T.	Old Forge, Pa.
B.Sc., Pennsylvania State College.	
Brown, Edgar M.	Hartford, Conn.
B.Sc., Massachusetts Agricultural College.	
Gordon, Howard R.	Ipswich.
B.Sc., Massachusetts Agricultural College.	
Lacroix, Donald S.	Amherst.
B.Sc., Massachusetts Agricultural College.	
Merritt, Lucius A., Jr.	Williamsburg.
B.Sc., Trinity College.	
Nickerson, Emelyn G.	Provincetown.
B.A., Wellesley College.	
Patch, Henry L.	Wenham.
B.Sc., Massachusetts Agricultural College.	
Richardson, Lewis E.	Millis.
B.Sc., Massachusetts Agricultural College.	
Richmond, E. Avery	Brockton.
B.Sc., Dartmouth College.	
M.A., Cornell University.	

CLASS OF 1925.

Armstrong, Bradford	Kensington, Md.	Q. 1
Barnes, Adrian Douglas	South Weymouth	Q. 1
Bean, Francis Irving	Bradford	Q. 1
Benoit, Helen Anna	Amherst	16 Belchertown Road.
Binner, Roger Stokehill	Amherst	Ambert House.
Bray, Ralph Hastings	Framingham	Sigma Phi Epsilon.
Burhoe, Sumner Othniel	Westborough	42 Lincoln Avenue.
Cahill, Carl Winfield	Newburyport	Kappa Sigma.
Casey, Alice Rita	Fall River	Abigail Adams House.
Cassano, Joseph ¹	Groveland	Q. T. V.
Church, George Lyle	Dorchester	Alpha Gamma Rho.
Cleaves, Leighton Greenwood	Gardner	Phi Sigma Kappa.
Cooke, Robert Gordon	Atlantic	Alpha Sigma Phi.
Corwin, Emil Joseph	Winthrop	13 South College.
Crosby, John Samuel	Arlington	Phi Sigma Kappa.
Currier, Leland Little	Marblehead	Alpha Gamma Rho.
Davis, Osborne Ozro	Belchertown	20 South College.
DeVito, Dominick	Roxbury	Kappa Epsilon.
Duffy, Leo Francis	Springfield	Kappa Epsilon.
Emery, George Edward	Marlborough	Sigma Phi Epsilon.
Ferranti, Edmund Tony	West Bridgewater	Lambda Chi Alpha.
Frost, Willard Chamberlain	Milford	Theta Chi.
Gilbert, Chauncey McLean	North Amherst	Meadow Street.
Gleason, Harold Albert	Chester	Phi Sigma Kappa.
Gordon, Samuel Francis	Ipswich	Lambda Chi Alpha.
Gordon, Solomon	Boston	13 South College.
Grover, Walter Champion	Barnardston	Phi Sigma Kappa.
Guterman, Carl Edward Frederick	Springfield	Kappa Sigma.
Haeussler, Gilbert Julius	Springfield	Kappa Sigma.
Hanscomb, George Wilmont	North Attleborough	Lambda Chi Alpha.
Harris, Clarence Albert	Utica, N. Y.	16 South College.
Holbrook, Lester Morse	Fairhaven	Lambda Chi Alpha.
Holteen, John Gunnar	Quincy	Kappa Gamma Phi.
Hyde, John Worthington	Amherst	79 Pleasant Street.
Ingraham, Edward Forster	Millis	Sigma Phi Epsilon.
Jack, Melvin Clifton	Amherst	16 Hallowell Street.
Kakavas, James Christo	Lowell	2 North College.
Keith, Lewis Hayden	Bridgewater	Kappa Sigma.
Kennedy, Lowell Francis	Cambridge	Q. T. V.
Lacey, John Sebastian	Holyoke	Alpha Sigma Phi.
Lavallee, Louis Palmer	Worcester	5 Nutting Avenue.
Lord, John Frederic	Methuen	Alpha Sigma Phi.
Love, Andrew Wyllie	Auburn	Alpha Gamma Rho.
Lunt, Samuel Wilde	Cumberland Center, Me.	Kappa Sigma.
Mahoney, Walter Francis	Millville	Alpha Sigma Phi.
Marx, Herbert John	Holyoke	Kappa Epsilon.
McGeoch, Charles Ryerson	New Bedford	Kappa Epsilon.
Mouradian, Garabed Kevork	Bridgewater	Q. T. V.
Moxon, David	Holyoke	Kappa Epsilon.
Nelson, Paul Redfield	Holyoke	15 Phillips Street.
O'Connor, Arthur Maxwell	Amherst	35 Pleasant Street.
Oliver, Charles Frank, Jr.	Brockton	Lambda Chi Alpha.
Parker, Donald Llewellyn	North Adams	Sigma Phi Epsilon.
Peirce, Veasey	Dorchester	Phi Sigma Kappa.
Peltier, Xavier Paul	Spencer	Q. T. V.
Poey, Frederick	Boston	10 South College.
Reynolds, Joseph Sagar	Attleboro	Theta Chi.
Roberts, Verne Edward	Amherst	13 Amity Street.
Root, Frank Edson	Barnardston	Alpha Gamma Rho.
Ross, Charles Frederick	Lee	Sigma Phi Epsilon.
Ross, Donald Ernest	Amherst	13 Woodside Ave.
Rowley, Harold Frederick	West Wareham	15 Hallowell Street.
Samuels, Samuel Bernhard	Holyoke	14 South College.
Sazama, Robert Francis	Northampton	Alpha Sigma Phi.
Sheridan, Irwin Scott	Mansfield	Alpha Gamma Rho.
Shumway, George Francis	Monson	Physics Building.
Simpson, Gilbert	Holyoke	27 Fearing Street.
Slack, Marion Florence	Allston	Abigail Adams House.
Slown, William Arnold	Shelburne Falls	Physics Building.
Smith, Emily Greenwood	Stockbridge	Abigail Adams House.
Smith, Myron Newton	Millbury	Phi Sigma Kappa.
Sprague, Dudley deRochemont	Melrose	16 South College.
Taube, Gustave	Holyoke	15 South College.
Taylor, Milton Wight	Chatham	Kappa Sigma.
Templeton, Robert James	Boston	Lambda Chi Alpha.
Tower, Emerson	Meshanticut, R. I.	Lambda Chi Alpha.
Ward, Gordon Hugh	Englewood, N. J.	Alpha Gamma Rho.
Waterbury, Arthur Logan	Medford	Sigma Phi Epsilon.
Whittum, Walter Willard	Springfield	Kappa Gamma Phi.
Wilcox, Stanley Dewey	Springfield	Kappa Gamma Phi.
Wilder, Frank Harris	Sterling Jet.	Phi Sigma Kappa.
Woodbury, Samuel Lawrence	Springfield	Alpha Gamma Rho.
Zwisler, Frederick Fisher	Holyoke	Kappa Epsilon.

¹ Candidate for degree of bachelor of vocational agriculture.

CLASS OF 1926.

Albattini, Paul Fletcher	Billerica	Kappa Epsilon.
Anderson, Leslie Clayton	East Bridgewater	Lambda Chi Alpha.
Archer, Francis Everett	Hopkinton	Phi Sigma Kappa.
Baker, Frederic Albert	Springfield	Phi Sigma Kappa.
Barker, Elmer Everett	Jamaica Plain	Kappa Epsilon.
Bates, Russell Norman	Wallingford, Conn.	Sigma Phi Epsilon.
Bartlett, Herbert Franklin	West Springfield	Alpha Gamma Rho.
Block, Harry William	East Boston	13 South College.
Bosworth, Marguerite Rose	Holyoke	Abigail Adams House.
Bosworth, Maude Elinor	Holyoke	Abigail Adams House.
Bower, James, Jr.	Holyoke	Kappa Epsilon.
Boyd, Mary Turck	Jacksonville, Fla.	Abigail Adams House.
Brougham, Earle Gordon	Holyoke	Alpha Sigma Phi.
Bruerton, Earle Wallace	Reading	Sigma Phi Epsilon.
Buckley, Arthur Vincent	Natick	Kappa Sigma.
Budge, William Karl	Mattapan	3 North College.
Burnham, James Erastus	Springfield	Lambda Chi Alpha.
Burt, Stanley Lyman	Easthampton	10 South College.
Cassidy, Marion Stewart	Wellesley	Abigail Adams House.
Cormier, Francis Joseph	Newtonville	Phi Sigma Kappa.
Couhig, Philip Henry	Beverly	Q. T. V.
Cromack, Aaron Field	Shelburne Falls	Theta Chi.
Davenport, Preston Julian	Shelburne Falls	17 Fearing Street.
Davis, Evelyn Louise	Springfield	Abigail Adams House.
Dean, Cecil Wallace	West Palm Beach, Fla.	12 South College.
Dick, Ernest Albert	Lawrence	Alpha Gamma Rho.
Dodge, Eliot Perkins	Beverly	Theta Chi.
Doolittle, Alden Hartwell	Northfield	Aggie Inn.
Douglass, Earle Lawrence	Springfield	Alpha Gamma Rho.
Dow, Philip Norman	Bolton	Alpha Gamma Rho.
Drake, Dorothy Madeline	Cambridge	Abigail Adams House.
Ducharme, Lucien Henry	Holyoke	Kappa Epsilon.
Durkee, Lewis Leland	Beverly	Theta Chi.
Fessenden, Richard William	Middleborough	Alpha Gamma Rho.
Fish, Donald Otis	Amherst	Kappa Sigma.
Fitzgerald, Lillian Alice	Holyoke	Abigail Adams.
Flynn, Alan Foster	Newton	Kappa Epsilon.
Ford, William Warner	Dalton	Stockbridge Hall.
Fraser, Carl Arthur	Westborough	Theta Chi.
Fraser, Harry Edward	Jamaica Plain	Kappa Sigma.
Galbraith, Leo Lake	South Hadley	Kappa Gamma Phi.
Gavin, Linus Arthur	Natick	Kappa Sigma.
Goodwin, Marvin Warren	Reading	Alpha Sigma Phi.
Goren, Louis	Chelsea	14 South College.
Grant, Theodore James	Auburndale	Theta Chi.
Grayson, Herbert	Milford	Alpha Sigma Phi.
Greenwood, Elliott Kelton	Hubbardston	M. A. C. Farmhouse.
Gustafson, Alton Herman	Campello	Clark Hall.
Hatch, Harold Curtis	Melrose	Alpha Gamma Rho.
Haynes, Walter Lincoln	Springfield	Phi Sigma Kappa.
Hill, Arthur Blair	Walpole	Phi Sigma Kappa.
Hollingsworth, Duncalf Wright	Providence, R. I.	Lambda Chi Alpha.
Howes, Stanley Edward	Brimfield	Alpha Gamma Rho.
Huke, Barbara Allen	South Hadley Falls	Abigail Adams House.
Jameson, Matthew	Everett	Kappa Epsilon.
Jensen, Harold Stery	Westfield	Sigma Phi Epsilon.
Johnson, Philip Gordon	Amherst	West Street.
Jones, Alvah Wesley	Salisbury	Kappa Gamma Phi.
Jones, Lawrence Lakin	Campello	7 North College.
Kafafian, Sarkis Petros	Amherst	11 North College.
Kelso, George	Reading	Sigma Phi Epsilon.
Lambert, John Ford	Gleasondale	Lambda Chi Alpha.
Langshaw, Hatton, Jr.	Fairhaven	Alpha Sigma Phi.
Larsinos, George John	Westfield	17 North College.
Lindskog, Herbert Alf	Roxbury	Kappa Epsilon.
MacMasters, Majel Margaret	Ashburnham	Abigail Adams House.
Mann, Albert Irving	Dalton	Sigma Phi Epsilon.
McNamara, Charles Henry	Stoughton	Kappa Sigma.
Meserve, George Donald	Hudson	Lambda Chi Alpha.
Moberg, Herbert Elof	Brookton	Alpha Sigma Phi.
Moran, John	Amherst	51 Northampton Road.
Needham, Basil Arthur	Taunton	Sigma Phi Epsilon.
Nichols, Chester Willard	Natick	32 North Prospect Street.
Nickerson, Elsie Elizabeth	East Boston	Abigail Adams House.
Norcross, Roy Ellis	Brimfield	16 South College.
Novick, Leo Altschuler	Amherst	56 Pleasant Street.
Otto, Raymond Herman	Lawrence	Kappa Gamma Phi.
Palmer, Cary Davis	Grafton, Vt.	3 North College.
Pomeroy, Elizabeth Clark	Longmeadow	Abigail Adams House.
Potter, Royal Wesley	Providence, R. I.	Phi Sigma Kappa.
Putnam, Ruth Evelyn	Greenfield	Abigail Adams House.
Rainault, Ernest	Holyoke	Kappa Epsilon.
Reed, Charles Porter	West Bridgewater	Lambda Chi Alpha.

Ribero, Edwin Francis	Amherst	29 Northampton Road.
Richards, James Marsh	Springfield	Phi Sigma Kappa.
Richardson, Henry Howe	Millis	Phi Sigma Kappa.
Robinson, Clifton Fairbanks	Newtonville	Q. T. V.
Rowen, Edward Joseph	Westfield	Sigma Phi Epsilon.
Sawyer, Roland Damon, Jr.	Ware	Aggie Inn.
Shea, Margaret Catherine	Holyoke	Abigail Adams House.
Simonds, Henry Erving	Winchester	Lambda Chi Alpha.
Smiley, Ray Guild	Worcester	Alpha Sigma Phi.
Smith, Margaret Park	Taunton	Abigail Adams House.
Smith, Raymond Ellingwood	Salem	Mt. Pleasant.
Sniffen, Loren Fallow	Westport, Conn.	84 Pleasant Street.
Spooner, Raymond Hildreth	Brimfield	Clark Hall.
Stevens, Alvin Gay	Needham	Kappa Sigma.
Stopford, William Turner	Newtonville	Theta Chi.
Sullivan, Charles Noyes	Fall River	Alpha Sigma Phi.
Sullivan, Donald Clifford	Amherst	25 Gray Street.
Temple, John Burrington	Shelburne Falls	17 Fearing Street.
Tetreault, Albert Joseph	New Bedford	Sigma Phi Epsilon.
Thompson, Gerald Thayer	Shelburne Falls	Theta Chi.
Thurlow, George Harold	West Newbury	Kappa Sigma.
Tucker, Edwin Locke	Baldwinsville	Kappa Gamma Phi.
Tulenko, John	Sunderland	Sunderland.
Turner, Charles Edgar	Springfield	8 Mt. Pleasant.
Walsh, Philip Baker	Amherst	4 Chestnut Street.
Warren, Francis Walter	Stow	Theta Chi.
Wheeler, Ellsworth Haines	Bolton	Alpha Gamma Rho.
White, Earl Martin	Abington	Kappa Sigma.
White, Montague	West Hartford, Conn.	Q. T. V.
Williams, Donald Reed	Northfield	Alpha Sigma Phi.

CLASS OF 1927.

Adams, James Prescott	Medway	Q. T. V.
Ames, Robert Call	Vineyard Haven	46 Pleasant Street.
Ames, Winthrop Ashley	Vineyard Haven	32 North Prospect Street.
Amstein, William Gerald	South Deerfield	Q. T. V.
Anderson, Andrew Bremer	Hudson	Lambda Chi Alpha.
Baker, Philip Woodell	Amherst	124 West Street.
Barney, Laurence Hillman, Jr.	New Bedford	Phi Sigma Kappa.
Belden, Sanford Oscar ¹	Bradstreet	Kappa Sigma.
Berry, George Robert	Northampton	10 North College.
Biron, Raphael Alfred	Amesbury	Theta Chi.
Black, Lewis Herbert	Williamsburg	Alpha Gamma Rho.
Boden, Frank Joseph	North Wilbraham	29 North Prospect Street.
Botulinski, Frank John	Boston	Stockbridge Hall.
Bovarnick, Max	Dorchester	56 Pleasant Street.
Bray, Frederick Roland	Amherst	5 Hitchcock Street.
Briggs, Lawrence Elliott	Rockland	Theta Chi.
Brooks, William Henry, 2d	Holyoke	Phi Sigma Kappa.
Bruce, Frances Clara	Easthampton	Abigail Adams House.
Buckler, Ella Maud ²	Pittsfield	Abigail Adams House.
Burrell, Robert Wallace	Abington	Theta Chi.
Carlson, Oscar Ernest ²	Boston	66 Pleasant Street.
Cartwright, Calton Oliver ¹	Northampton	Kappa Epsilon.
Chamberlain, Alexander Rodger	Springfield	Lambda Chi Alpha.
Clagg, Charles Floyd	Everett	Alpha Gamma Rho.
Cobb, Roger Madison	Wrentham	15 Hallowell Street.
Connell, Edward Anthony	Malden	Sigma Phi Epsilon.
Crooks, Clarence Arthur	North Brookfield	Alpha Gamma Rho.
Cummings, Maurice Andrew	Cambridge	Theta Chi.
Davison, Ruth Eugenia	West Springfield	Abigail Adams House.
Difley, Raymond Frederick	Worcester	51 Amity Street.
Dole, William Levi	Medford	Kappa Sigma.
Estes, Wendall Eames	West Duxbury	Care of Mr. Everson.
Evans, Joseph Andrew	Lawrence	13 North College.
Farwell, Theodore Austin	Turners Falls	Alpha Sigma Phi.
Flemings, Frederic James	Sharon	Theta Chi.
Foley, Richard Carol	Portland, Me.	Sigma Phi Epsilon.
Fuller, George Leonard	Haydenville	North Amherst.
Galanie, Demetrius Lincoln	Natick	Alpha Sigma Phi.
Goldberg, Louis Noah	Wilmington	15 South College.
Goller, Hilda Margaret	Holyoke	Abigail Adams House.
Goodell, Ruth Edna	Westborough	Abigail Adams House.
Greenaway, James Emerson	Springfield	Lambda Chi Alpha.
Griffin, Raymond George	Southwick	Sigma Phi Epsilon.
Haertl, Edwin Jacob	Dorchester	Kappa Sigma.
Hanson, Daniel Cameron	Dracut	21 Fearing Street.
Harris, Herbert Joseph	Springfield	Apiary, M. A. C.
Hart, Ralph Norwood	Dorchester	Alpha Gamma Rho.
Haskins, Ralph Warner	Greenfield	Q. T. V.
Hatch, George Franklin, Jr.	West Roxbury	22 Sunset Ave.
Henneberry, Thomas Vincent	Manchester	4 North College.
Hilyard, Joseph Rayman	Beverly	Q. T. V.

¹ Candidate for degree of bachelor of vocational agriculture.² Admitted on probation, entrance record incomplete.

Horner, David James	West Pelham	29½ Lincoln Ave.
Huber, Richard Alden	East Northfield	97 Pleasant Street.
Huthsteiner, Elladora Kathryn	Pittsfield	Abigail Adams House.
Johnson, Gustaf Arthur	Amherst	Theta Chi.
Joyce, Milton Goff	Rumford, R. I.	44 Triangle Street.
Kelton, Richard Coolidge	Hubbardston	13 North College.
Krassovsky, Leonid Alexander	Russia	Kappa Gamma Phi.
Kuzmeski, John William	Leverett	Leverett.
Leland, Ralph Chester	East Bridgewater	40 Sunset Avenue.
LeNoir, Thomas Benjamin t	Greenwood	Alpha Sigma Phi.
Loud, Emery Shaw	Rockland	Theta Chi.
Lyman, Orlando Hammond	Hilo, Hawaii	83 Pleasant Street.
Malley, Joseph Anthony	Watertown	Stockbridge Hall.
Manter, Nelson Laird	Clinton	Lambda Chi Alpha.
Maxwell, Lewis Joseph	Stoneham	West Experiment Station.
McAllister, Robert Wright	North Billerica	21 Fearing Street.
McCabe, Edith Mary	Holyoke	Abigail Adams House.
McVey, Ernest Gregory	Dorchester	Care of Mr. Everson.
Merlini, Angelo Albert	North Adams	Sigma Phi Epsilon.
Merrill, Winslow Eaton	Wilmington	81 Pleasant Street.
Milligan, Kenneth William	State Line	Lambda Chi Alpha.
Morrill, Alfred Clayton	Natick	Phi Sigma Kappa.
Mullen, Francis Redding	Becket	Sigma Phi Epsilon.
Murdough, Edwin Lincoln	Springfield	Lambda Chi Alpha.
Nash, Norman Blake	Abington	11 South College.
Nottebaert, Harry Charles	Lexington	Lambda Chi Alpha.
Parkin, William Hildreth	Chicopee	Kappa Epsilon.
Parsons, Clarence Howard	North Amherst	North Amherst.
Parsons, Josiah Waite, Jr.	Northampton	Kappa Sigma.
Partenheimer, Merrill Henry	Greenfield	Phi Sigma Kappa.
Patton, William King	Holyoke	12 North College.
Pickens, Herman Eames	Stoneham	East Experiment Station.
Powell, Charles Mason	Brookfield	Theta Chi.
Pratt, Martha Elizabeth	Hadley	Hadley.
Pyle, Everett John	Plymouth	Theta Chi.
Reed, James Burbank	Waltham	Theta Chi.
Rhoades, Lawrence Duncan	New Marlborough	West Experiment Station.
Richter, Otto Hermann	Holyoke	Alpha Sigma Phi.
Rivnay, Ezekiel	Holyoke	56 Pleasant Street.
Robinson, Neil Cooley	Arlington	8 North College.
Russell, Charles Edwin	Dodge	30 Fearing Street.
Savage, Donald Clifford	West Medford	13 Phillips Street.
Sharp, Dallas Lore, Jr.	Hingham	Care of Mr. Everson.
Snyder, Allen	Holyoke	12 North College.
Spelman, Albert Francis	New London, Conn.	Q. T. V.
Swan, Frederick Walter	Milton	Q. T. V.
Sweetland, Augustus Francis	Stoneham	Q. T. V.
Thompson, Arthur Richard	West Bridgewater	Lambda Chi Alpha.
Tobey, Edwin Albert	Belmont	Phi Sigma Kappa.
VanHall, Walter Bernhardt	Roslindale	3 North College.
Verity, Herbert Foster	Woburn	Q. T. V.
Walker, Almeda Marion	Southbridge	Abigail Adams House.
Whitaker, Lewis Harlow	Hadley	Kappa Sigma.
White, John Everett	Abington	Kappa Sigma.
Wiggin, Jennie May	Worcester	Abigail Adams House.
Williams, Earl Fletcher	Whitinsville	Kappa Epsilon.
Wilson, James Stewart	Brooklyn, N. Y.	84 Pleasant Street.
Worssam, Horace Herbert	Bernardston	Q. T. V.
Yarwood, George Arthur	Syracuse, N. Y.	101 Butterfield Terrace.

CLASS OF 1928.		
Abrahamson, Howard Joseph	Waltham	16 South College.
Agambar, Arnold William	Holyoke	81 Pleasant Street.
Amatt, Jack	Northampton	716 Bridge Street, North- ampton.
Barber, Ruth Moulton	Monson	Abigail Adams House.
Barnard, Ellsworth	Shelburne Falls	17 Fearing Street.
Bartlett, Kenneth Alden	Dorchester	83 Pleasant Street.
Baumgartner, Hans	Pittsfield	29 East Pleasant Street.
Bearse, Gordon Everett	Medfield	1 North College.
Beeman, Marjorie Elise	Ware	Abigail Adams House.
Blomquist, Gustave Stanley	Quincy	83 Pleasant Street.
Bradford, David Carlton	Springfield	30 North Prospect Street.
Bray, Walter Abner	Amherst	5 Hitchcock Street.
Brockway, Horace Taylor, Jr.	South Hadley	9 South College.
Browne, Carroll Behan	Holyoke	30 Fearing Street.
Bryant, Thomas Marble	Wollaston	83 Pleasant Street.
Campbell, Donald Hays	Shirley	12 South College.
Campion, Thomas Joseph	Amherst	83 Pleasant Street.
Capone, Mario	Chelsea	29 Lincoln Avenue.
Carlson, Julius Anselm	North Abington	53 Lincoln Avenue.
Carter, Warner Harris	Amherst	R. F. D., Amherst.
Chadwick, John Shore	Worcester	27 Fearing Street.
Chapin, Horace Ralph	Chicopee Falls	60 Pleasant Street..

1 Admitted on probation, entrance record incomplete.

Chapman, Dorothy Ann	Newtonville	Abigail Adams House.
Charleston, George Robinson	Everett	101 Pleasant Street.
Clapp, Nathaniel	Greenfield	70 Lincoln Avenue.
Clark, Harold Eugene	Montague	97 Pleasant Street.
Cleary, Mary	Ayer	Abigail Adams House.
Coe, Edith Beatrice Cecilia	Holyoke	Abigail Adams House.
Cook, Albert Cairnes	Waverley	9 North College.
Crowley, Francis Jeremiah	Amherst	20 Woodside Avenue.
Cunningham, James Hugh	Atlantic	11 South College.
Daniels, David Watson, Jr.	Sherborn	10 North College.
Davis, Richard Jackson	Arlington	9 Fearing Street.
Dean, Carolyn	Utica, N. Y.	Abigail Adams House.
Delaney, John	Holyoke	10 Nutting Avenue.
Denton, Ian Oliphant	Norton	33 Pleasant Street.
Devine, John Warren	Arlington	21 Fearing Street.
Draper, William Hill, Jr.	Watertown	86 Pleasant Street.
Dresser, Horatio Malcolm	South Hadley	5 Mt. Pleasant.
Duffield, Susan Muir	Detroit, Mich.	Abigail Adams House.
Eager, Vincent Shattuck	Berlin	3 Fearing Street.
Elder, Hubert Gray	Amherst	39 Amity Street.
Elliott, Lawrence William	Waltham	16 South College.
Ewer, Seth Judson	Leyden	13 Phillips Street.
Fell, Ernest Millward	Fall River	27 Fearing Street.
Ferguson, Thomas Wells, Jr.	Stow	M. A. C. Farmhouse.
Ford, John Francis	Lenox	7 Phillips Street.
Forest, Joseph Henry	Arlington	21 Fearing Street.
Fox, Pincus	Holyoke	233 Walnut Street, Holyoke.
Fox, Robert Leo	Ware	16 Nutting Avenue.
Frame, Charles Frederick	Rockland	53 Lincoln Avenue.
Frese, Paul Frederick	Waltham	7 McClellan Street.
Frost, Charles Austin	Belmont	15 North College.
Fuller, Francis Edward	Framingham	Care of Mr. Everson.
Galvin, John James	Conway	30 North Prospect Street.
Galvin, William Frederick	Greenfield	14 North College.
Gifford, Charles Edwin	Sutton	6 Nutting Avenue.
Goldberg, Maxwell Henry	Stoneham	15 South College.
Golden, Walter James	Brookfield	70 Lincoln Avenue.
Goldich, Louis	Philadelphia, Pa.	13 South College.
Golledge, Robert James	Cheshire	7 McClellan Street.
Gwynn, Arthur William	Rosindale	3 Nutting Avenue.
Haigs, Frederick Earl	Turners Falls	75 Pleasant Street.
Hall, Barbara Janet	Great Barrington	Abigail Adams House.
Hall, John Stanley	Lynn	17 Phillips Street.
Hamilton, Thomas Arnold	Fair Haven, Vt.	16 North College.
Harrington, Mary Eileen	Holyoke	Abigail Adams House.
Harris, Edmund George	Baldwinsville	Kappa Gamma Phi.
Hemenway, Truth Mary	Holden	Abigail Adams House.
Hintze, Roger Thomas	Amherst	13 North Prospect Street.
Hodson, Alexander Carlton	Reading	7 Phillips Street.
Holland, Bertram Holbrook	Millis	18 Nutting Avenue.
Homeyer, Frank Fuller	Wellesley Farms	84 Pleasant Street.
Howe, Frank Irving, Jr.	Norfolk	10 Nutting Avenue.
Howland, Walter Morton	Conway	44 Sunset Avenue.
Hynd, James Pratt	Holyoke	6 Gilman Street, Holyoke.
Hynes, Ralph William	Holyoke	81 Pleasant Street.
Isham, Paul Dwight	Hampden	15 Fearing Street.
Kane, Thomas Joseph	Westfield	8 Allen Street.
Karrer, Robert Joseph	Hingham	17 Phillips Street.
Kennedy, Wellington Waterloo, 3d	Red Bank, N. J.	8 North College.
Kidder, Dana Judson, Jr.	Fayville	6 Nutting Avenue.
Kimball, John Adams	Littleton	42 McClellan Street.
Knox, Barbara Howard	Taunton	Abigail Adams House.
Lane, Donald Ricker	Brockton	7 North College.
Lapean, Gerald John	Montague City	75 Pleasant Street.
LaPrise, Albert Joseph	Great Barrington	84 Pleasant Street.
Lassiter, Elizabeth Ruth	Holyoke	Abigail Adams House.
Laubenstein, Karl George	Maynard	8 North College.
Lawrence, Julia Ruth	Springfield	Abigail Adams House.
Leonard, Charles Smith	Chicopee	53 Lincoln Avenue.
Leonard, Dorothy Luella	West Springfield	Abigail Adams House.
Lincoln, Robert Alexander	Hingham	53 Lincoln Avenue.
Little, Margaret Adams	Newburyport	Abigail Adams House.
Loring, Douglas Winthrop	Springfield	6 Nutting Avenue.
Madden, Thomas Raymond	Natick	97 Pleasant Street.
Mahoney, John Joseph	Westfield	8 Allen Street.
Marston, Leon Chester, Jr.	Brockton	27 Fearing Street.
Martino, Dominico	Everett	29 Lincoln Avenue.
Marx, Walter Herman	Holyoke	9 South College.
McCloskey, Francis Frederick	Winchester, N. H.	Care of R. C. Adams.
McEwen, Leslie Irving	Winchester	44 Triangle Street.
McGuire, Walter Kenneth	Whitinsville	35 East Pleasant Street.
Moore, Ethan Dana	West Springfield	30 North Prospect Street.
Morey, Elizabeth Alma	Wollaston	Abigail Adams House.

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Moriarty, Robert Earl	Monson	21 Fearing Street.
Morland, Harold Laurud ¹	Islington	66 Pleasant Street.
Mousley, Louis Brooks	Lafayette, Ind.	3 McClellan Street.
Mulhern, Daniel Joseph	Rosindale	6 North College.
Murch, Ralph Gordon	Holliston	5 North College.
Murray, Chester Leroy	Greenfield	51 Amity Street.
Noble, Frank Freeman ¹	Fall River	3 Allen Street.
Nutting, John Lyman	West Berlin	3 Fearing Street.
O'Connell, Charles Francis	Cambridge	86 Pleasant Street.
O'Connor, Margaret Merrill	Haverhill	Abigail Adams House.
Olson, Edith Anita Hildegarde	Holden	Abigail Adams House.
Owers, Robert Hammond	Taunton	18 Cottage Street.
Paige, Herman Alfred	Dorchester	Mt. Pleasant.
Panizza, Josephine	Boston	Abigail Adams House.
Perkins, Edwin Harriman	Georgetown	15 Phillips Street.
Pickard, Ashley Houghton	Littleton	42 McClellan Street.
Pickett, Thomas Austin	Beverly	3 Nutting Avenue.
Pincombe, Caroline Louise	North Adams	Abigail Adams House.
Plantinga, Oliver Samuel	Amherst	R. F. D. 3, Box 18.
Plantinga, Sarah Theodora	Amherst	R. F. D. 3, Box 18.
Poppie, Harold Sidney	Northampton	16 North College.
Pratt, Marjorie Johnson	Dalton	Abigail Adams House.
Prentiss, Adelaide Hathaway	Plainfield, Conn.	Abigail Adams House.
Preston, Charles Putnam	Danvers	83 Pleasant Street.
Preston, Stanley Nichols	Danvers	83 Pleasant Street.
Proctor, Harriet Ellise	South Weymouth	Abigail Adams House.
Purrington, Rachel Elizabeth	Shattuckville	Abigail Adams House.
Quinn, John Francis	New Bedford	50 Northampton Road.
Redgrave, Arnold Ide	Hopedale	83 Pleasant Street.
Reed, Roland Ellsworth	Greenfield	14 North College.
Reynolds, John, Jr. ¹	Hatchville	69 Lincoln Avenue.
Rice, Cecil Curtis	Worcester	30 Fearing Street.
Richardson, Alden Lafayette	Groveland	Care of Prof. Banta, Sunset Avenue.
Richardson, Evan Carleton	Millis	18 Nutting Avenue.
Ricker, Albion Barker	Turner, Maine	5 North College.
Rodimon, Warner Scott	Florence	15 North College.
Roper, Hartwell Eveleth	Closter, N. J.	M. A. C. Farmhouse.
Rouillard, Henley Granville ¹	East Longmeadow	20 North Prospect Street.
Rourke, Charles Henry	Framingham	8 Kellogg Avenue.
Ryan, Edward Parker ¹	Swampscott	6 Nutting Avenue.
Saunders, Francis William	Keene, N. H.	Kappa Sigma.
Schappelle, Newell Allen	Amherst	25 Amity Street.
Schmidt, Ernest John	Longmeadow	6 Nutting Avenue.
Simmons, Oliver Dorrance	Beverly	84 Pleasant Street.
Slate, Robert Irving	Bernardston	10 North College.
Smith, Bessie May	Somerville	Abigail Adams House.
Smith, Charles James, Jr.	North Wilmington	15 Phillips Street.
Smith, Eliey Herbert	West Springfield	20 North Prospect Street.
Smith, Leslie Rockwell, Jr.	Hadley	Hadley.
Smith, Walter Russell	Holden	18 Cottage Street.
Southgate, Barbara Willson	Boston	Abigail Adams House.
Spencer, Ernest Leavitt	Lowell	83 Pleasant Street.
Stowell, Walter Henry	Grafton, Vt.	The Aggie Inn.
Stratton, Frank	Lawrence	86 Pleasant Street.
Thomas, Howard ²	Holyoke	6 Beacon Avenue, Holyoke.
Thompson, Frances Clarinda	Amherst	Mt. Pleasant.
Thompson, Leonard Louis	Greenfield	14 North College.
Trull, Henry Bailey	Lowell	84 Pleasant Street.
Tufts, Warren John	Jamaica Plain	1 North College.
Tulloch, George Sherloch	Bridgewater	Q. T. V.
Tuttle, Alden Parker	South Milford	Baker Place.
Vaughan, Herbert Sidney	Attleboro	6 Nutting Avenue.
Vetterstrand, Marguerite	Northampton	Abigail Adams House.
Voetsch, George Bernard	Greenfield	70 Lincoln Avenue.
Warfield, Eleanor Thayer	Worcester	Abigail Adams House.
Washburn, Edward Allen ²	Marion	86 Pleasant Street.
Weaver, Edward Leigh ¹	Amherst	Pine Street.
Welch, Richard Francis	Salem	4 Nutting Avenue.
Wendell, George Goodwin	Belmont	9 North College.
Whitcomb, Oliver Adams	Littleton	42 McClellan Street.
White, Edwin Seales	Worcester	9 Fearing Street.
Wilcox, Philip Emerson ²	Rockland	15 Fearing Street.
Wilder, Edwin Arthur	Sterling	83 Pleasant Street.
Williams, Florence Dorothea	East Norton	Abigail Adams House.
Williams, Lloyd George	Pittsfield	17 Phillips Street.
Wilson, George Stewart	Framingham	81 Pleasant Street.
Yarrows, Joseph John	Hatfield	Hatfield.
Young, Edward Henry	Northampton	53 Lincoln Avenue.
Zielinski, Carl Bernard ²	Holyoke	3 Fearing Street.

¹ Candidate for degree of bachelor of vocational agriculture.

² Admitted on probation, entrance record incomplete.

REGISTERED AFTER THE CATALOGUE FOR 1923 WAS PUBLISHED.

Class of 1927.

Waite, Clifton Brooks Orange.

Special Students.

Binner, Theresa Marie Amherst.
 Cadogan, Kathryn Wakefield.
 Larrabee, Edward Noble West Roxbury.

SPECIAL STUDENTS.

Allen, Leo Linwood Fenton	Orange	4 Nutting Avenue.
Baucus, Harriet Flood	Northampton.	Northampton
Burnett, Marston	Cambridge	Wilder Hall.
Coveney, John Joseph	Amherst	R. F. D. 3, Box 82.
Delaney, Rose Margaret	Holyoke	Draper Hall.
Gilbert, Marguerite Frances	Amherst	Meadow Street.
Globus, Joseph	Attleboro	Poultry Plant.
Johnson, Catherine Genevieve	Amherst	West Street.
Jones, Pearl	Troy, Ala.	Abigail Adams House.
Matson, Anna Nathalie	Pasadena, Calif.	Abigail Adams House.
Norrie, Lawrence Edward	Springfield	9 Fearing Street.
Patterson, Jane	Amherst	26 Lincoln Avenue.
Perley, Sadie	Boston	Abigail Adams House.
Pierpont, Mildred	Amherst	28 Pleasant Street.
Pushee, George Frederick	Amherst	North Amherst.
Reid, Howard Stanton	Franklin	18 Cottage Street.
Shepard, Eleanor Chalmers	Pepperell	120 Pleasant Street.
Thayer, Charles Hiram	Amherst	South East Street.
Thompson, Alice Elizabeth	Amherst	Mt. Pleasant.
Waugh, Sidney Biehler	Amherst	M. A. C.

GEOGRAPHICAL SUMMARY.

Massachusetts	520	Maryland	1
Connecticut	7	Missouri	1
New York	5	South Dakota	1
Rhode Island	4	Washington	1
Maine	3	West Virginia	1
Michigan	3	Wisconsin	1
New Jersey	3	Utah	1
Vermont	3	Asia Minor	1
Florida	2	Canada	1
New Hampshire	2	Hawaii	1
Pennsylvania	2	Russia	1
South Carolina	2	Trinidad	1
Alabama	1		
California	1		
Indiana	1		
		Total	571

SUMMARY BY CLASSES.

CLASS.	Men.	Women.	Total.
Graduate School	53	8	61
Seniors, 1925	79	4	83
Juniors, 1926	99	14	113
Sophomores, 1927	100	10	110
Freshmen, 1928	153	31	184
Specials	9	11	20
Totals	493	78	571

SHORT COURSE ENROLLMENT.

TWO-YEAR GRADUATES, 1924.

Aldrich, James Orin	Belchertown.
Austin, Eunice Marie	Fall River.
Beley, Robert Arsene	Newtonville.
Bisbee, John Carroll, Jr.	Moretown, Vt.
Blanchard, Lawrence Newell	Leominster.
Booth, George Wellesley	Everett.
Brown, Herbert Ellsworth	Shrewsbury.
Bryant, Berton Davis	Lowell.
Carter, William Bradley	Tewksbury.
Chisholm, Roy Bedford	Dorchester.
Clarkson, Arnold	Reading.
Cole, Albert Bradley	Millbrook, N. Y.
Conklin, Lester Martin	Patchogue, N. Y.
Craig, Kenneth	Boston.
Cromack, Elwin Baldwin	Colrain.
Cutler, Samuel Austin	Boylston.
Darling, Walter	Franklin.
Dennen, Charles Otis	East Pepperell.
Dennison, Leon Henry	Atlantic.
Densmore, Theodore Calder	Natick.
Eastwood, Wilfred	North Adams.
Emery, Russell Louis	Needham.
Files, Arthur Dysart	Wilbraham.
Fitts, Harry Bucklin	Orange.
Fortune, Battie Holmes	Boston.
Glencross, John Donald	Canada.
Goode, Frank Arthur	Boston.
Goodnow, Alice Marguerite	Athol.
Haffermehl, Forrest Wendell	Newton Center.
Harris, George Mitchell	Lynn.
Hawthorne, Peter, Jr.	Amherst.
Haynes, Joseph Haynes	Keene, N. H.
Hazard, James Joseph	Westwood.
Hazen, Stanley Luther	Longmeadow.
Healey, Martin Joseph	Lynn.
Higgins, Leonard Martin	Fall River.
Howe, Wesley Mason	Millbury.
Hulbert, Jewett William	Dorchester.
Jones, Charles	Waitsfield, Vt.
Jones, Wendell Albert	Rosindale.
Joslin, Ralph Herbert	Waitsfield, Vt.
Lauterbach, Louis Jacob	Rosindale.
Longley, Lawrence Stanley	Greene, Me.
Lowe, Dwight Mansfield	Watertown.
MacFadyen, Alfred Wellington	Wellesley.
Macuen, Harvey Andrew	Newton.
Martyn, Roland Fowler	West Suffield, Conn.
Miller, Everett Woodman	Fairhaven.
O'Doherty, John Edward	Woburn.
Olsen, Harold Bailey	Pepperell.
Paddock, Franklin Selby	Worcester.
Palmer, Albert Tresnon	Everett.
Parsons, Sidney Wing	Conway.
Peaslee, George Raymond	Pittsfield.
Peklaris, Spiros Antony	Lowell.
Sahlin, Carl Evert	Somerville.
Scotland, Gordon Lionel	Saxonville.
Solomon, Maurice	Melrose.
Springer, Harry Brooke	Harland, Vt.
Stevens, Glenn William	Waverley.
Stover, Walter Edward	Wellesley.
Tobin, Michael Francis	Adams.
Tucker, Clarence Murray	Waitsfield, Vt.
Turfts, Clarence Joseph	Worcester.
Walker, Franklin Perry	Westborough.
Webster, Phyllis	Cambridge.
White, Laurence Schaffner	Dover.
White, Newell Dudley	Bristol, Conn.

SECOND YEAR TWO-YEAR STUDENTS, 1924-25.

Ackerman, Randolph Spofford	Salisbury	Sunset Avenue, care of Mr. Banta.
Ansell, Harold King	Grantwood, N. J.	3 McClellan Street.
Arnold, Elliott Frank	Woburn	Kolony Klub.

Baker, Willis A.	Boston	Kolony Klub.
Berry, Harold Edward	Natick	Kolony Klub.
Breckenridge, Earl	Andover	Fearing Street, care of Mrs. Nims.
Buswell, Albert Henry	Belmont	Kolony Klub.
Caless, Thomas Winfred	Westford	25 Gray Street.
Cepurneek, Andrew John	Wrentham	A. T. G. North College.
Chilson, Dorothy Lila	Huntington	Abigail Adams House.
Cooper, Janice Marie	Westfield	Abigail Adams House.
Crooks, Donald Lovell	North Brookfield	15 Hallock Street.
Crooks, Harold Baker	North Brookfield	15 Hallock Street.
Cummings, Frank James	North Adams	17 Phillips Street.
Dennett, James Winslow	Plympton	A. T. G. North College.
Derby, Benjamin Edward	Concord Junction	60 Pleasant Street.
Devine, Theodore Joseph	Taunton	3 Allen Street.
Frawley, Earl Alton	New Bedford	Kolony Klub.
Friedli, George Edward	Yonkers, N. Y.	A. T. G. North College.
Frieb, George Joseph	Boston	60 Pleasant Street.
Fuller, Douglas William	Southampton, N. Y.	108 Pleasant Street.
Griswold, Christine Mueller	Springfield	Abigail Adams House.
Hall, Ivory Arthur	South Portland, Me.	3 Nutting Avenue.
Harrington, Donald Francis	Framingham	A. T. G. North College.
Harrington, Douglas Waldomar	Framingham	A. T. G. North College.
Hartney, Clyde Clarence	Athol	A. T. G. North College.
Hayn, Ernest Morris	Springfield	108 Pleasant Street.
Hines, Oliver Clayton	Amherst	Amherst House.
Hoyle, William	Northborough	71 Main Street.
Jordan, William D.	Somerville	97 Pleasant Street.
Kane, John Vincent	Lenox	Kolony Klub.
Keyes, Madelon Frances	Dorchester	Abigail Adams House.
Kingsbury, Carl Manning	Woodville	Sunset Avenue, care of Mr. Banta.
Kyle, Gordon	Everett	The Davenport.
Lacombe, Albert George	Beverly	-
Lahey, Jeremiah Joseph	Plymouth	97 Pleasant Street.
Lawton, Clarence Copeland	Worcester	3 McClellan Street.
Lindgren, Lawrence Edward	Amherst	60 Pleasant Street.
Matuleurcz, Andrew Joseph	Orange	60 Pleasant Street.
Mecum, Ethel Doris	Becket	Abigail Adams House.
Mellor, John Albert	Somerville	13 Phillips Street.
Merryman, Rebecca Eastman	Bradford	Abigail Adams House.
Montagne, Guilford	South Deerfield	97 Pleasant Street.
Morrissey, John Francis	Brooklyn, N. Y.	97 Pleasant Street.
Murphy, Thomas Patrick	Woburn	Kolony Klub.
Myers, Morley Whitfield	Hingham	Kolony Klub.
McGregor, Janet	Haverhill	Abigail Adams House.
Nutter, Richard Louis	Melrose Highlands	20 Spring Street.
O'Hara, Francis Edward	Worcester	3 McClellan Street.
Patch, Frederic Whiting	Framingham	A. T. G. North College.
Patterson, Harold Taylor	Barre	75 Pleasant Street.
Payne, Donald Tubbs	Dunstable	116 Pleasant Street.
Perkins, Harold Kent	Melrose Highlands	5 Hitchcock Street.
Pickard, Cyrus Warren	Concord Junction	A. T. G. North College.
Pomeroy, Allen Bradford	Longmeadow	Kolony Klub.
Power, James Anthony	Arlington	Kolony Klub.
Ross, Edward Cooper	Watertown	Fearing Street, care of Mrs. Nims.
Scott, Thomas John	Bristol, Conn.	108 Pleasant Street.
Severance, Charles Almon	Moultonboro, N. H.	Kolony Klub.
Stow, Basil Tenney	Stow	R. F. D. No. 3, Amherst.
Thompson, Kenneth Horatio	Revere	45 Pleasant Street.
Titus, Alvin Randolph	Allston	17 Phillips Street.
Tower, Lester Wilton	South Weymouth	M. A. C. Farm.
Towne, Milton Curtis	Petersham	60 Pleasant Street.
Welch, John D.	Northfield, Vt.	75 Pleasant Street.
Woodruff, Webster Clinton	Fitchburg	30 Fearing Street.
Wright, Harriett Goodhue	Boston	Abigail Adams House.

FIRST YEAR TWO-YEAR STUDENTS, 1924-25.

Adams, Charles	Rutland	165 South Pleasant Street.
Alcott, Elverton Hunting	Newton	Mt. Pleasant, care of Professor Sears.
Ames, Bessie Bell	Marshfield Center	Abigail Adams House.
Anderson, Frederic	Grafton	81 Pleasant Street.
Apelquist, Philip Eugene	Orange	Pine Street.
Banks, Harold Bryant	Holliston	35 East Pleasant Street.
Bassett, Sherrold Emerton	Everett	17 Phillips Street.
Belcher, Ranald Ashley	North Abington	35 East Pleasant Street.
Blood, Charles Andrew Fletcher	Pepperell	116 Pleasant Street.
Bradley, Howard Courtland	Seekonk	9 Fearing Street.
Brown, Charles Franklin	Worcester	116 Pleasant Street.
Brown, Earl	Amherst	Pelham Road.
Bumstead, Augustine	Medford	35 East Pleasant Street.
Burgevin, Paul Louis	Port Chester, N. Y.	75 Pleasant Street.
Callander, Murray Austin	Boston	55 Amity Street.
Carl, Sidney	Hatfield	83 Pleasant Street.
Carrington, Harvie Brigham	Huntington	27 East Pleasant Street.

Clark, Stewart Floyd	Conway	Mt. Pleasant, care of Mr. C. R. Green.
Cogswell, Sarah Ellen	Westborough	Abigail Adams House.
Comeau, Charles Edward	Concord Junction	60 Pleasant Street.
Cree, Stephen Comey	Leicester	4 Hallock Street.
Crocker, Ralph Herman	Holliston	6 Nutting Avenue.
Davidson, Henry Wilbur	Auburn	116 Pleasant Street.
Davis, Charles Ellsworth	North Adams	23 East Pleasant Street.
Davis, William Hazen	Ward Hill	29 North Prospect Street.
DeLano, Fred Lewis	Richmond Hill, N. Y.	29 North Prospect Street.
DeLorenzo, Joseph	Kingston	35 East Pleasant Street.
Desrosiers, Adolphe Biron	Orange	Pine Street.
Dillon, Frank Edward	New Bedford	Baker Lane.
Dingley, Elmer Albion	Sherborn	3 Fearing Street.
Donnelly, Edward Boyce	Waltham	21 Pleasant Street.
Forgie, James Brice	Boston	6 Nutting Avenue.
Foster, William Edward	Ipswich	South College.
Fullam, Kenneth Bullord	North Brookfield	15 Hallock Street.
Goldthwaite, Ernest	Dunstable	17 Phillips Street.
Granger, Edward Whitney	Huntington	South Amherst, care of J. W. Tufts.
Hawes, Ralph Edmund	Sudbury	97 Pleasant Street.
Hayden, Charles Ernest	Newtonville	35 East Pleasant Street.
Hayden, Robert Evans	Brookville	97 Pleasant Street.
Herron, Frank Robert	Greenfield	The Davenport.
Hess, Frank Wesley	Springfield	84 Pleasant Street.
Holden, Clayton Lewis	Bondsville	68 Lincoln Avenue.
Hoxie, Edward Graham	Dalton	18 Cottage Street.
Humphrey, Leo Harris	Medford	North Pleasant Street, care of R. C. Adams.
Hyde, Gerald	Buzzards Bay	116 Pleasant Street.
Jansen, Wesley Leonard	Amherst	18 East Street.
Johnson, Gunnar Theodore	Leicester	31 North Prospect Street.
Johnson, Tage Frederick	Milton	6 Nutting Avenue.
Kaakinen, Theodore	Fitchburg	17 Phillips Street.
Ladd, Joseph Mark	Worcester, Vt.	44 Pleasant Street.
Leoncini, Louis John	Milford	83 Pleasant Street.
Markert, Ernest Frederick	Amherst	West Street.
Massa, Andrew Louis	East Boston	35 East Pleasant Street.
Mathews, George Williams, Jr.	Dedham	116 Pleasant Street.
Meeker, Alice Maude	Ludlow	Abigail Adams House.
Mellen, James Dwight	Athol	29 East Pleasant Street.
Menchin, Elinor Louise	North Weymouth	Abigail Adams House.
Miller, Edward Doring	Lee	81 Pleasant Street.
Morey, Alfred William	Cummington	South Amherst, care of A. B. Richards.
MacCulloch, William Webster	Salem	17 Phillips Street.
Maclean, Theodore Elwin	Hadley	84 Pleasant Street.
McCurdy, John	Gardiner, Maine	41 Pleasant Street.
Nash, Alexander Allaire	Mattapoisett	6 Nutting Avenue.
Newhall, Benjamin Weston	Danvers	84 Pleasant Street.
Palmer, Charles Stephen	Weymouth	45 Pleasant Street.
Parsons, Harold Kenneth	Brooklyn, N. Y.	24 McClellan Street.
Parsons, Philip Hinde	Manchester	4 Hallock Street.
Pearse, William Thomas	Rockland	101 Pleasant Street.
Porr, John L.	Bronx, N. Y.	Box 125, M.A.C.
Potter, Charles Elliott	Hyde Park	35 East Pleasant Street.
Prouty, Homer Spooner	Hardwick	23 East Pleasant Street.
Putnam, Frank Wendell	West Newton	66 Pleasant Street.
Richards, Foster Herbert	Lowell	1 Cottage Street.
Riley, Ernest Francis	Dedham	31 North Prospect Street.
Root, Worth Stewart	Colrain	97 Pleasant Street.
Rowell, Elisabeth Johnson	Groton	Abigail Adams House.
Ryan, Roger Wolcott	Pepperell	60 Pleasant Street.
Safran, Mayer	Manchester, N. H.	56 Pleasant Street.
Sawyer, Roland Willard	Groton	R. F. D. No. 3, North Amherst.
Shelnut, Charles Francis	South Boston	4 Hallock Street.
Smith, Edith Caswell	Wakefield	Abigail Adams House.
Snyder, Frederic Burley	Wakefield	Mt. Pleasant, care of Mr. C. R. Green.
Steele, Putnam	Milton	66 Pleasant Street.
Strong, Arthur Eugene	Amherst	13 Hallock Street.
Sullivan, Maurice Laurence	Peabody	45 Pleasant Street.
Tonseth, Richard	Lunenburg	4 Hallock Street.
Tribe, Stanley Gordon	West Somerville	55 Amity Street.
Truelson, Stanley Dunham	Somerville	3 Nutting Avenue.
Varnum, William Parker	Collinsville	1 Cottage Street.
Walker, Roger Francis	South Sudbury	97 Pleasant Street.
Wheadon, Willard Spencer	Chelsea	29 Lincoln Avenue.
Whitcomb, Janet	Haverhill	Abigail Adams House.
Wood, Helen May	Stoughton	Abigail Adams House.
Yocum, Margaret Gardner	Irvington, N. J.	Abigail Adams House.

SPECIAL TWO-YEAR STUDENTS, 1924-25.

Caless, Mrs. Sybell	Westford	25 Gray Street.
Thayer, Richard	Somerville	Kolony Klub.

WINTER SCHOOL, 1924.

Ames, John A.	Piermont, N. H.
Anglim, Henry T., Jr.	Brockton.
Baudin, Elias	Springfield.
Beiser, Herbert K.	North Caldwell, N. J.
Bergstrom, Eric H.	Lynn.
Blaschah, John	Springfield.
Brickman, Anna	Great Barrington.
Buckshorn, Fisher	Westford.
Chadwick, F. E.	Woodsville, N. H.
Cooney, John J.	Lowell.
Davis, Horace	Rochester.
Dehner, Cecil	Burlington, Iowa.
Doescher, Fred	Houlton, Me.
Doescher, Mrs. Fred	Houlton, Me.
Donaldson, Fred A.	Greenfield.
Drain, Mrs. Brooks D.	Amherst.
Duno, Harold	Lowell.
Dunsmoor, Ethelbert W.	Hampden.
Fair, James E.	Frammingham.
Fillmore, William L.	Amherst, N. S.
Flavin, Edmund J.	Malden.
Fogg, Sarah B.	Greensburg, Pa.
Gardner, George E.	Somerville.
Gaston, N. E.	Concord.
Gaunt, Frank L.	Springfield.
Geiger, Mary E.	Pepperell.
Goldthwaite, Roger G.	Dunstable.
Greenwood, Burton H.	Brooklyn, N. Y.
Groepier, Martin, Jr.	Yonkers, N. Y.
Harnett, Francis	Milton.
Hescock, Ralph W.	West Brattleboro, Vt.
Hickson, Robert C.	Shrewsbury.
Holden, Henry R.	Amherst.
Horak, Joseph A.	Lynn.
Hoyle, Walter J.	Woonsocket, R. I.
Jackson, Noble T.	Boston.
Jenks, Elsworth F.	Amherst.
Jenks, George H.	South Dartmouth.
Jones, Mrs. Martha W.	Quakertown, Pa.
Knuksen, John T.	Boston.
Larose, Ernest A.	South Hadley.
La Salle, James H.	North Hadley.
Lee, Lydia C.	Boston.
L'Esperance, Herbert C.	Cambridge.
Markert, Richard H.	Amherst.
McCann, F. J.	Clinton.
McNamara, Roger	Greenfield.
Merchant, Percy A.	Gloucester.
Monroe, Huntington T.	Frammingham.
Moore, Frank C.	Keene, N. H.
O'Neil, Harry C.	Amherst.
Parker, Charles W.	East Orleans.
Parker, Mrs. Charles W.	East Orleans.
Parker, Royce M.	South Chelmsford.
Parsons, Kenneth P.	Clinton.
Prince, Carleton S.	Arlington.
Richards, Fred V.	Milton.
Richardson, Ralph S.	Brockton.
Rogers, John	Cambridge.
Rogers, William	Fairhaven.
Rossi, Orpheus J.	Medfield.
Sears, Francis H.	Charlemont.
Smith, Edgar W.	Lowell.
Smith, Herbert C.	Woodville.
Stanford, Joseph H.	Rowe.
St. Martin, Alfred	Holyoke.
Sullivan, Charles A.	Dorchester.
Tait, Raymond G.	Springfield.
Taylor, Charles	Whitman.
Tsourides, Nicholas A.	Worcester.
Turner, E. H.	Everett.
Vanderploeg, Bernice M.	Holland, Mich.
Wade, Senior	Woonsocket, R. I.
Walter, Elmer H.	Melrose.
Webb, Kenneth	Needham Heights.
Weinsel, Beatrice	Norwich, Conn.
West, Osborne	Hadley.
Wheaton, Willard	Chelsea.
Wheeler, Phillips W.	Randolph.
Wile, Ira R.	New York, N. Y.
Wilton, Charles W.	North Andover.
Yarrows, Elias	Amherst.
Zahir, Alfred	Amritsar, India.

SUMMER SCHOOL STUDENTS, 1924.

Acheson, Lillian	Fall River, Mass.
Alley, Alice J.	Amherst, Mass.
Alvord, Alice	Easthampton, Mass.
Anderson, Leslie	East Bridgewater, Mass.
Avery, Roy C.	New York, N. Y.
Belcher, D. Webster	Hatfield, Mass.
Belyea, Beatrice M. A.	East Bridgewater, Mass.
Boland, Mary L.	Worcester, Mass.
Bolles, Audrey	Amherst, Mass.
Booth, Sarah E.	Springfield, Mass.
Brockway, Alice M.	South Hadley, Mass.
Brown, Marguerite Z.	Amherst, Mass.
Brown, Mildred E.	North Amherst, Mass.
Brown, Paul W.	Fiskdale, Mass.
Burnham, Dorothy I.	Newtonville, Mass.
Campbell, N. Merle	East Lynn, Mass.
Campion, Margaret E.	Amherst, Mass.
Canavan, Anne M.	Amherst, Mass.
Cassano, Joseph	Groveland, Mass.
Cassidy, Morton H.	Amherst, Mass.
Clark, Mabelle J.	Sunderland, Mass.
Connolly, Helen M.	Dorchester, Mass.
Cooke, Joan L.	Amherst, Mass.
Coveney, John	Amherst, Mass.
Cussell, Julia	Lawrence, Mass.
Davenport, Mrs. Pearl T.	Amherst, Mass.
Davis, Josephine E.	Holden, Mass.
Davis, Orrin C.	Belchertown, Mass.
Devine, John W.	Arlington, Mass.
Dickinson, Laura A.	North Amherst, Mass.
Dickinson, Mrs. Mary M.	Amherst, Mass.
Duffy, Leo F.	Springfield, Mass.
Durkee, Lewis L.	Beverly, Mass.
Eastwood, John E.	Plymouth, Mass.
Elder, Helen B.	Amherst, Mass.
Ely, Genevieve M.	Northampton, Mass.
Everson, Bettina L.	Amherst, Mass.
Fairty, Florence M.	New Canaan, Conn.
Fein, Louis	Springfield, Mass.
Flynn, Alan F.	Newton, Mass.
Ford, Violet C.	Holyoke, Mass.
Geiger, Eleanor C.	Pepperell, Mass.
Gibbard, James	Toronto, Ontario, Canada.
Gilbert, Chauncey M.	Amherst, Mass.
Gilbert, Mrs. Marguerite F.	Amherst, Mass.
Gledhill, Minnie L.	Amherst, Mass.
Glick, Mrs. Mabel R.	Amherst, Mass.
Gordon, Samuel F.	Ipswich, Mass.
Gregory, Helen J.	Northampton, Mass.
Griffin, Bridget	Bondsville, Mass.
Haigis, Frederick E.	Turners Falls, Mass.
Harris, Edmund G.	Baldwinville, Mass.
Hatch, Mrs. Mary A.	Holyoke, Mass.
Hays, Frank A.	Amherst, Mass.
Hemenway, Mrs. Elsie W.	Northampton, Mass.
Hemenway, Truth M.	Holden, Mass.
Holbrook, Lester M.	New Bedford, Mass.
Horner, David J.	West Pelham, Mass.
Hyde, William E.	Amherst, Mass.
Jack, Melvin C.	Amherst, Mass.
James, Marvin E.	Florence, Mass.
Jones, Janet M.	Amherst, Mass.
Kelsey, Edmund B.	Amherst, Mass.
Kenney, George S.	Amherst, Mass.
Kenney, Irene E.	Amherst, Mass.
Kingsford, Vera A.	Boston, Mass.
Kielbowicz, Nellie	Amherst, Mass.
Knightly, Mary R.	Amherst, Mass.
Kostenbader, Marie	Holyoke, Mass.
Kremensky, Susie M.	Hadley, Mass.
Lawley, Evelyn G.	Florence, Mass.
Leclair, Carmella M.	Amherst, Mass.
Leitch, Fredonna	Amherst, Mass.
Loomis, Susan B.	Lynn, Mass.
Luddington, Frank D.	Hamden, Conn.
Lyman, Elliott B.	South Hadley, Mass.
Mahoney, Walter F.	Milville, Mass.
Mansfield, Anne	Bondsville, Mass.
Mansfield, Bernard J.	Haydenville, Mass.
Mart, Willis H.	Richmond, Mass.
Martin, Frances B.	Amherst, Mass.
Martin, Margaret	Amherst, Mass.
Mayo, William I.	Northampton, Mass.
McDonnell, Anna H.	Florence, Mass.
McGrath, Grace A.	Northampton, Mass.

Medve, Elizabeth	Lawrence, Mass.
Merrill, Estella L.	North Lebanon, Maine.
Miller, Edith I.	Wakefield, Mass.
Mouradian, Garabed K.	Bridgewater, Mass.
Newlon, Mrs. J. B.	Amherst, Mass.
Nietzold, Hazel R.	Northampton, Mass.
Novitch, Sidney A.	Revere, Mass.
O'Connor, Arthur M.	Amherst, Mass.
Oettinger, Emma M.	Boston, Mass.
Page, Fay R.	Haydenville, Mass.
Parsons, Ethel E.	Northampton, Mass.
Parshley, Louise	Northfield, Mass.
Patterson, Florence	Amherst, Mass.
Phelan, John	Amherst, Mass.
Poe, Frederick	Havana, Cuba.
Powers, Marcella K.	Florence, Mass.
Prescott, Glenn C.	Florence, Mass.
Pushee, Julia L., Mrs.	North Amherst, Mass.
Reed, Mary L., Mrs.	Amherst, Mass.
Rice, Victor A.	Amherst, Mass.
Richardson, Lewis E.	Amherst, Mass.
Riley, Margaret A.	Holyoke, Mass.
Roberts, Verne E.	Amherst, Mass.
Robinson, Lewis B.	Pembroke, N. H.
Rose, Christina M.	Chester, Mass.
Rose, Grace M.	Chester, Mass.
Rundquist, Edna J.	Gloucester, Mass.
Sanctuary, William C.	Amherst, Mass.
Sanborn, Mrs. L. W.	North Amherst, Mass.
Sanderson, Susie E.	Haydenville, Mass.
Sawtelle, Donald W.	Amherst, Mass.
Sawyer, Mabel A.	Watertown, Mass.
Schenker, Elsie A.	Holyoke, Mass.
Scribner, Agnes E.	Amherst, Mass.
Searle, Jean N.	Amherst, Mass.
Shaw, Doris E.	Amherst, Mass.
Shaw, Edna A.	Amherst, Mass.
Simonds, Henry E.	Winchester, Mass.
Smart, Harold W.	Amherst, Mass.
Smith, Myron N.	Millbury, Mass.
Spaulding, Marion E.	Amherst, Mass.
Spaulding, Ruth E.	Amherst, Mass.
Strickland, Elinor L.	Amherst, Mass.
Sturtevant, Ralph E.	Greenfield, Mass.
Sweetland, Augustus F.	Stoneham, Mass.
Thomas, Helen R.	Amherst, Mass.
Thompson, Alice E.	Amherst, Mass.
Thompson, Frances C.	Amherst, Mass.
Thompson, Nellie L.	Amherst, Mass.
Thornton, Clarence P.	West Pelham, Mass.
Thyng, Anne M.	Readfield, Maine.
Walsh, Elizabeth R.	Amherst, Mass.
Walsh, John L.	Amherst, Mass.
Warner, Frances A.	Amherst, Mass.
Warner, Irene C.	Amherst, Mass.
Wilder, Frank H.	Sterling, Mass.
Worsam, Horace H.	Bernardston, Mass.
Vetterstrand, Marguerite	Northampton, Mass.
Zwisler, Frederick F.	Holyoke, Mass.

STUDENTS REGISTERED AFTER THE CATALOGUE FOR 1923-24 WAS PUBLISHED.

Two-Year Course.

First year:	
Eissold, Richard Hiersche	Ludlow.
Prentiss, Mrs. Bertha White	Amherst.

Vocational Poultry Course.

Cahill, John Vincent	Lowell.
Cudak, Walter	Adams.
Emerson, William Henry	East Boston.
Grew, Bernard Carlton	Bass River.

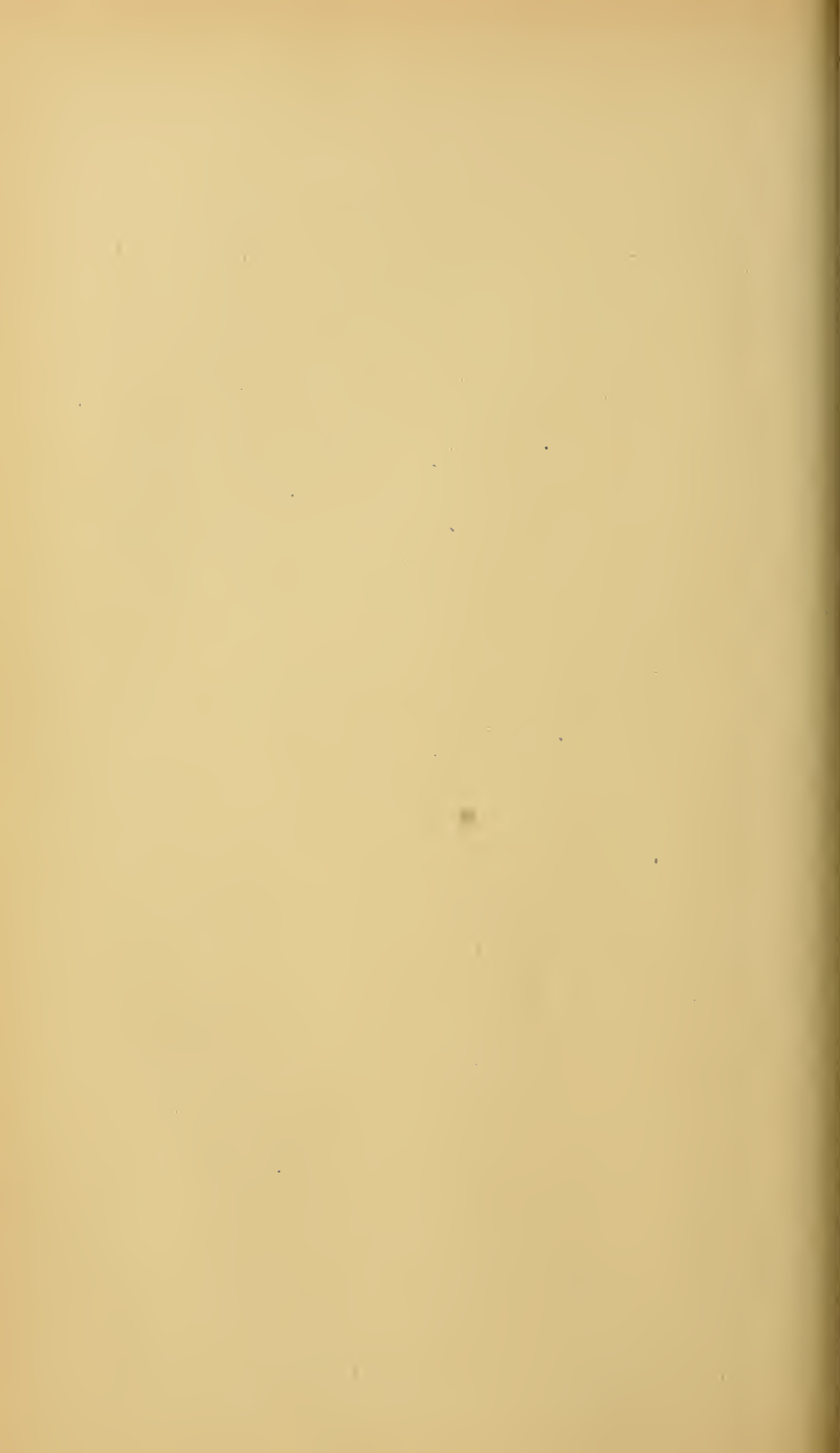
SUMMARY OF SHORT COURSE ENROLLMENT.

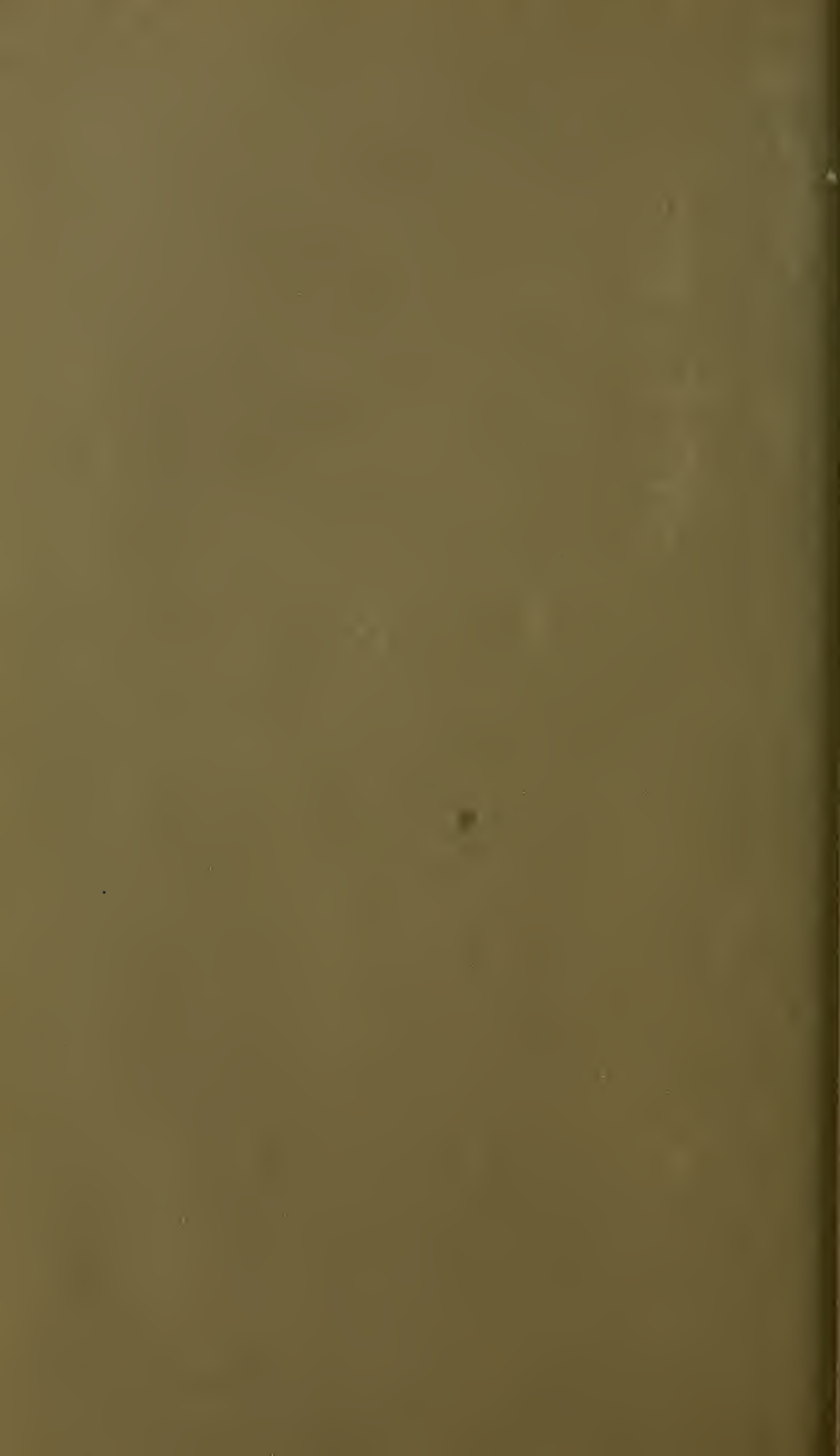
	Men.	Women.	Total.
Two-year Course, second year	59	8	67
Two-year Course, first year	85	9	94
Two-year Course, special students	1	1	2
Winter School, 1924	72	11	83
Summer School, 1924	55	89	144
Totals	272	118	390

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THE M. A. C. BULLETIN AMHERST, MASSACHUSETTS

VOLUME XVII FEBRUARY, 1925 NUMBER 2

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AGRICULTURAL COLLEGE: JAN., FEB., MARCH, MAY,
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THE SIXTY-SECOND ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

ISSUED IN ACCORDANCE WITH SECTION 8, CHAPTER 75, OF THE GENERAL LAWS

PART I.—THE REPORT OF THE PRESIDENT AND OTHER OFFICERS OF ADMINISTRATION FOR THE FISCAL YEAR ENDED NOV. 30, 1924



PUBLICATION OF THIS DOCUMENT APPROVED BY THE COMMISSION ON ADMINISTRATION AND FINANCE

DEPARTMENT OF EDUCATION
THE COMMONWEALTH OF MASSACHUSETTS

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PAYSON SMITH, *Commissioner of Education.*

EDWARD M. LEWIS, *Acting President of Massachusetts Agricultural College.*

MASSACHUSETTS AGRICULTURAL COLLEGE.

PRESIDENT'S REPORT, 1924.

REVIEW OF THE YEAR.

Trustee Changes.

On June 17 last, the College received the sad news of the death of Mr. Elmer D. Howe at his home in Marlborough, Mass. Mr. Howe was born in Marlborough September 10, 1860, and was appointed Trustee by Governor William E. Russell in January, 1893, to succeed Thomas P. Root of Barre. He served continuously as Trustee until his death. He was a member of the Committee on Course of Study and Faculty since 1893, of the Committee on Farm and Horticulture (later Horticulture) since 1895, and of the Committee on Extension Service, of which he was Chairman, since 1914.

Mr. Howe was a graduate of the college in the class of 1881 and soon after graduation came to be recognized as one of the foremost agricultural leaders of the State. His life was wholly spent on the farm and the record shows that he was an excellent and successful farmer. Though always a very busy man he gladly found time to devote to the solution of many of the vital problems pertaining to the welfare of Massachusetts agriculture. He was potent in promoting the organization of the Grange in this State and subsequently was honored as its leader. Indeed, he was really interested in every movement aiming at the co-operative welfare of farmers and in his later years gave active support to the Farm Bureau movement. Mr. Howe was a kindly, patient, tender gentleman of the old school who commanded respect wherever he went. He loved the College and gave to it an affectionate and faithful service. His loss will be keenly felt by us all for a long time.

The Trustees have placed on record the following resolutions:

"Whereas, The Divine Master has seen fit to remove from this life Elmer D. Howe who for years has served faithfully and well as a Trustee of this College, giving of his time and energy that the best interests of agriculture in our Commonwealth should be advanced by agricultural education; therefore, be it

"Resolved, That the Board of Trustees of the Massachusetts Agricultural College mourn the loss of a sincere, courteous gentleman, with whom it was ever a pleasure to work, who always had the courage of his convictions, and who always had the best interests of the College at heart;

"Resolved, further, That a copy of these resolutions be sent to the family of the deceased and a copy placed upon our records."

On September 3, 1924, the Governor's Council approved the appointment of Mr. John Chandler of Sterling Junction as Trustee of the College to fill the vacancy caused by the death of Mr. Howe. Mr. Chandler is a graduate of Yale, and a successful farmer. For years he has been an active leader in various agricultural organizations; at present he is President of the Massachusetts Farm Bureau Federation.

Resignations, Retirements, and Deaths.

KENYON L. BUTTERFIELD.

The year 1924 will ever stand out, in the history of the Massachusetts Agricultural College, as the year which marked the close of the brilliant administration of Kenyon Leech Butterfield, the seventh president of the institution. As you

already know, President Butterfield resigned in May in order to accept the honored leadership of the Michigan Agricultural College — his Alma Mater, and brought his labors here to a close the following August. Elected to the presidency at the age of thirty-eight he gave to this institution, therefore, the very best years of his life, and during that long period he strove earnestly and at all times to promote its highest good with unswerving fidelity and singleness of purpose. His administration was characterized by great wisdom, untiring energy, fine idealism and rapid and continuous expansion both in service and in influence.

President Butterfield entered upon his duties at the Massachusetts Agricultural College with the clearly defined and openly avowed purpose of maintaining and developing a high grade agricultural college. The institution, as he conceived it, should teach and study the fundamental sciences underlying the agricultural industry, train skillful farmers, educate leaders in the various agricultural professions, disseminate information concerning agriculture and the farm home to the people of the State, and in every way promote every interest of the countryside and country life. Under him the work of agricultural research was heartily encouraged; the curriculum of the four-year course was expanded; graduate courses were organized; short courses were established; and a comprehensive system of extension service was developed.

His achievements and success were due to a broad understanding of the problem of agriculture in its every phase; a rare capacity in the organization of projects and plans; the ability to discover and enlist capable associates for the work to be accomplished, and to inspire their best efforts and co-operation in its successful attainment.

Besides remarkable gifts of leadership, President Butterfield possessed unusual powers of prevision. He was one of the first to advocate a scheme of popular dissemination of agricultural information. His pioneer spirit anticipated the nation-wide Extension Service. He was one of the first to see the problem of the farmer as inevitably concerned with distribution as well as with production. His foresight saw the rural problem as essentially a human problem and the social conditions of the rural people to be a prime and essential factor in maintaining a satisfying agriculture and rural life. In recent years he was defining the scope of the agricultural colleges as embracing the entire field of food supply, including production, distribution, consumption and preservation.

His abilities were early recognized, and gradually opened for him the door of a nation-wide service. In 1908 he was named as a representative of the State of Massachusetts to the White House conference in Washington to consider the problem of national conservation. In 1908, also, he was appointed by President Roosevelt as a member of the Country Life Commission. Associated with him were Gifford Pinchot, Liberty Hyde Bailey, and the late Henry Wallace, the late Walter Hines Page, C. S. Barnett, and W. A. Beard. In 1913 Woodrow Wilson appointed President Butterfield as a member of the American Commission on Rural Credits which spent four months in Europe making a careful study of agricultural credit and co-operation. In 1918 he was elected by the International Y. M. C. A. to take charge of the organization of vocational education among the American troops in France. In 1921 a commission was organized to visit China for the purpose of making a comprehensive study of her educational needs and of reporting a desirable educational program for that vast Empire. President Butterfield served on this Commission as the expert in vocational education.

We are too close to the administration and work of our recent leader to be able adequately to evaluate the character and magnitude of his contribution. Future historians will accord him, we may predict, a very high place in the list of the real leaders and pioneers of American agriculture and of American country life. All we can do at this time is to express simple and sincere gratitude, and to affirm with pride that Kenyon L. Butterfield was a man of broadest vision and of outstanding leadership — a wise administrator and builder — a gentleman of rare personal charm, of unbending moral convictions, and of highest ideals, who gave the unusual powers and energies of his best years joyously and unreservedly to the great cause of agriculture and to the education of the youth and people of Massachusetts.

PHILIP BEVIER HASBROUCK.

On a beautiful summer morning last July our College community was shocked by the sad announcement of the sudden death of Professor P. B. Hasbrouck. He had been troubled during the past four or five years with a weakened heart. His spirit was such, however, that we lived in the hope that he would regain his strength and health once again. But it was not to be.

Professor Hasbrouck was born in Libertyville, Ulster County, New York, in 1870. He was graduated from Rutgers in 1893, having specialized in mathematics, physics, and civil engineering. He came to M. A. C. in 1895 as Assistant Professor of Mathematics. He was made Associate Professor of Mathematics and Adjunct Professor of Physics in 1903 and Professor of Physics and Head of Department in 1911. In 1905 he was appointed Registrar of the College.

In the death of Professor Philip Bevier Hasbrouck the College has lost a servant who possessed the qualities of a teacher in a marked degree. Scores of men who studied under him freely acknowledge and gratefully remember the devotion which was given so gladly and generously. In his capacities of teacher and registrar Professor Hasbrouck's opportunities for meeting students were many and frequent. In spite of his often brusque demeanor most of his students became his staunch friends and held him in highest esteem. So also did his colleagues, and all who saw beneath the exterior the sincerity of purpose and big heart of the man. Few men on any faculty are privileged to be so generally beloved. His death brought a heavy pang to many friends and closed a life wholly dedicated through many years to the service of the College and of "the boys."

JOHN PHELAN.

On August 31, 1924, John Phelan resigned to accept a position of larger responsibility under President Butterfield at the Michigan Agricultural College.

Professor Phelan came to the Massachusetts Agricultural College in 1915 as Professor and Head of the Department of Rural Sociology. He was an excellent teacher and attracted to his courses a comparatively large number of students. In 1918 he was appointed Director of Short Courses. In this position he rendered an outstanding service to the College. It was given to him to organize a two-year course in practical agriculture, in response to a legislative resolution that such should be established. In formulating this course Director Phelan introduced the feature of six months' practical farm experience, on approved farms under supervision; this training period comes between the first and second years of school work and must be satisfactorily completed before the student may graduate. Under his direction the winter school and the summer school were developed and enlarged in scope and new courses to meet special demands were established, notably short courses for florists, gardeners, and dairymen.

Immediately after the Armistice in 1918, the College announced its availability to train men discharged from the Army and Navy. Short courses were at once arranged and the registration was large from the first. Later M. A. C. was designated as the training center for New England to which disabled service men should be sent for rehabilitation in agriculture. Upon Director Phelan was placed the responsibility of organizing the many courses necessary to meet the varied requirements of such men. Over 650 Federal Board men have attended the College since 1919, and about 100 of them are still under the supervision of the Short Course organization. Through the Short Course as developed during the five years of Professor Phelan's leadership the usefulness of the College to the farmers of the State was significantly multiplied.

HENRY S. GREEN.

After approximately three years of excellent service, Dr. Henry S. Green retired as Librarian November 12, 1924, having at that time reached the age limit.

New Appointments of Department Heads.

BASIL B. WOOD.

Upon the resignation of Dr. Green, Basil B. Wood was appointed Librarian of the College. Mr. Wood was for the past four years librarian at the Westerly, Rhode Island, Public Library. Previously he had served at the John Crerar Public Library in Chicago; at the Berkshire Athenæum in Pittsfield; at the Springfield City Library, and in the Army Camp Libraries at Camp Gordon and at Camp Lee. Mr. Wood is a graduate of Brown University in the class of 1905.

ROLAND H. VERBECK.

On September 19, 1924, Roland H. Verbeck was appointed Director of Short Courses to succeed Professor John Phelan. Mr. Verbeck was graduated from M. A. C. in 1908, having specialized in Agricultural Education. He served first as Principal of the High School at Petersham and subsequently as Principal at Parsonsfield, Maine. Prior to the war he pursued graduate study at Harvard University. In the summer of 1917 he enlisted in the air service of the United States Army and served a year in France. From 1919 till June, 1924, he served with marked success as Director of the School of Agriculture at Saint Lawrence University, Canton, New York.

Improvements and New Construction.

The buildings under construction and the improvements that have been made during 1924 are as follows:

1. The completion of the Chemistry Building at a cost of \$300,000.
2. The addition to the Rural Engineering Building at a cost of \$15,000.
3. The erection of the tobacco barn, \$3,000.
4. The erection of the head-house at the Agronomy Greenhouse, \$2,650.
5. Continuing the concrete walk, \$1,000.
6. Numerous other improvements, such as the repairs to the East Experiment Station Greenhouse and the Agricultural Greenhouse.

Commencement, 1924.

At the commencement exercises held June 19, 1924, eighty-six B.S. degrees were awarded, eighty-two to men and four to women. The Degree of Bachelor of Vocational Agriculture was conferred upon one student who had entered from the Norfolk County School of Agriculture and had completed four years of undergraduate work on the basis of a modified program. The Degree of Master of Science was conferred upon four men, the Degree of Master of Landscape Architecture upon one, and the Degree of Doctor of Philosophy upon one.

The Commencement address was delivered by President Kenyon L. Butterfield upon the topic "Facing the Future." This was the final official appearance of President Butterfield before the College he so dearly loved.

Enrollment of Students.

The enrollment of students in the four-year course this autumn is 489, an increase of 56 over a year ago. This increase is due to the larger freshman class which this year numbers 183 as compared with 125 in 1923. This year's freshman class has substantially the same enrollment as had the class entering two years ago. The total enrolled in work of college grade including graduate and special students is 571, an increase of 60 over the enrollment of 1923.

Owing to the small class entering the two-year course in 1923, the total enrollment this year in that course is slightly less than that of a year ago although the number entering the first year class in 1924 increased by 14 over the enrollment of the preceding year. The total enrollment in 1924 is 164 as compared with 173 in 1923.

Work in Home Economics.

Since 1919 courses in home-making have been offered at M. A. C. The increasing interest in these courses, and the demand from the resident women students for additional work, together with urgent requests from many High School girls who have wished to pursue a major in Home Economics as part of their college work have steadily pointed towards the need for developing this work.

At the opening of the College year in September, 1924, more adequate provision was made for women students who wished to pursue a major in Home Economics. The emphasis is upon home-making as a fundamental vocation and will involve such courses as the study of clothing, its choice, cost, care and construction; the selection and preparation of food; nutrition and dietetics; the planning, furnishing and management of the home; the health of the family, including the care and health of children; and community relationships of the home. Thirty-one girls entered with the freshman class this autumn, and at present the total enrolled in the four-year course is 59. Some of these will undoubtedly wish to major in Home Economics and all of them will probably want to take more courses in the subject than was heretofore possible.

Boys' Camp.

In 1924 for the second time a summer camp for boys was conducted. Both of the camps have been run along lines which result in a nominal net expense to the institution. The camp was directed by Mr. Richard A. Mellen, Field Agent of the College, assisted by student counsellors. The average weekly enrollment for each of the four weeks in 1924 was 20. The daily program included elementary instruction in various agricultural subjects. One serious handicap under which the camp operates is that it has no adequate facilities for swimming, and other water sports.

Food Supply.

In recent years President Butterfield defined the scope of the agricultural colleges as that of embracing not only production and distribution of food but also its consumption and preservation. There was presented to the Legislature of 1924 a bill authorizing the appointment by the Governor, of a Commission which would study the questions of the Massachusetts Food Supply. Inasmuch as this bill had been introduced jointly by the College and the Department of Agriculture and had the support of various commercial organizations it was hoped that favorable consideration would be given it by the Legislature. The bill, however, was finally rejected. In the furtherance of this project numerous addresses were delivered during the year before Women's Clubs, Rotary Clubs, Chambers of Commerce, Granges, etc. Members of our staff who delivered addresses on the Massachusetts Food Supply and the number of them are as follows:

	No. of Lectures
President Kenyon L. Butterfield	10
Dean Edward M. Lewis	8
Director Sidney B. Haskell	8
Director John D. Willard	6
Professor A. E. Cance	7
Professor John Phelan	11
Dr. R. J. McFall	1

Gifts to the College.

During the year the College has been the recipient of several handsome gifts to be used for the promotion of scholarship and to assist needy students and farmers. They are:

1. THE FREDERICK G. CRANE FUND.

The family of the late Frederick G. Crane of Dalton presented to the College a gift of \$25,000 to establish a fund in memory of Frederick G. Crane, the income therefrom to be expended by the Trustees in aid of worthy undergraduate four-year students of limited financial resources attending the College, preference being given to residents of Berkshire County.

The initial announcement concerning the distribution of this fund provides that all applications for loans or gifts from this fund shall be made to the President of the College, under whose direction an investigation will be made as to the relative merits of the applications. The purpose of this investigation will be to insure that the aid is extended to students whose parents are in such financial condition that assistance is necessary in order to insure a college education for the applicants; that it be extended only to students who propose to complete their college education at the Massachusetts Agricultural College; and that it be given only to those whose character and scholarship record justifies it.

Grants from the Crane Fund are made to freshmen in the form of loans supported by notes bearing endorsements satisfactory to the President of the College. These notes bear interest and are negotiable. The College, however, will at its discretion cancel these notes at the end of one year if the scholarship record of the student, his character, and his plans for the future appear to the President so to warrant.

Grants are made to sophomores either on the plan outlined for freshmen as given above or on the plan outlined for juniors and seniors as given below.

Grants to juniors and seniors are usually in the form of gifts and are awarded with consideration of the need, of the scholarship, and of the character of the applicant.

The amount of grants from this fund, made either as loans or as gifts, will be determined by the need of the applicant in each case and by the amount of money available in the fund.

2. SCHOLARSHIPS IN AGRICULTURE AND HORTICULTURE.

One thousand dollars have been provided by the Massachusetts Society for the Promotion of Agriculture to be awarded to four-year students enrolled from Massachusetts and majoring in the Divisions of Agriculture and Horticulture, for meeting their expenses at M. A. C. for the college year 1925-26. It has been decided that these prizes shall be awarded as follows:

Two scholarships of \$200 each to members of the class of 1927 who are majoring in the Division of Agriculture or Horticulture.

Two scholarships of \$300 each to members of the class of 1926 who are majoring in the Division of Agriculture or Horticulture.

In awarding these prizes, consideration will be given to

1. Excellence in scholarship in all subjects up to the time the awards are made.
2. Attitude toward work.
3. Personal character.

The scholarships will be awarded by a Committee consisting of the Head of the Division of Agriculture, the Head of the Division of Horticulture, and the President of the College.

These scholarships will be granted only as in the opinion of the Committee of award, the achievements of those eligible warrant the award.

3. THE PORTER L. NEWTON FUND.

The residue of the estate of the late Porter L. Newton of Waltham estimated to be approximately \$25,000 has been left to the Massachusetts Agricultural College for the purpose of establishing "a fund to be known as the Porter L. Newton Fund, the income of which is to be used by the administrative officers of said College as scholarships for the education of such citizens of the United States, as said Trustees may deem worthy and deserving of the same."

4. THE LOTTA CRABTREE FUND.

By the will of the late Lotta Crabtree the residue of her estate estimated at from \$1,000,000 to \$2,000,000 was left in trust for the benefit of graduates from the Massachusetts Agricultural College desiring to establish themselves in farming. This bequest will be administered by a separate board of Trustees appointed by

the Testator. Neither the exact amount of the bequest nor the conditions under which it shall be administered are as yet known.

These bequests disclose a growing interest in the Massachusetts Agricultural College by those who are making bequests for charitable and educational purposes.

5. SPECIAL PRIZE.

Last year the Trustees of the Frederick Cornelius Eldred Memorial Athletic Fund offered a prize of \$50 to that member of the Senior class of the College who should make the most constructive suggestions for the physical development of the student body with particular reference to the portion which does not participate in the major sports. The same prize is generously offered again for 1924-1925.

Infirmary.

Director Marshall, who has charge of the Infirmary, reports that the present year has been very satisfactory from several standpoints. There has been less contagious illness than usual and the nurse and matron are doing their work most acceptably. Dr. Marshall repeats, however, with some emphasis, his statement of two years ago to the effect that our quarters are altogether inadequate not only to meet serious epidemic conditions but also to meet normal demands. The increasing number of women, necessitating separation facilities raises the question of enlarged quarters more seriously than ever. *I agree with him entirely that some action is very much needed.*

Market-Garden Field Station.

The Market-Garden Field Station was established in 1916 as a branch of the Department of Market Gardening at the Massachusetts Agricultural College. Acting in co-operation and with the advice of the Boston Market Gardeners' Association a tract of twelve acres of land was bought in North Lexington upon which suitable greenhouses and service buildings were erected. The work was organized under the direction of Professor H. F. Tompson, then Head of the Department of Market Gardening, and was carried forward on the land in North Lexington until the late summer of 1924.

During the year 1923 an offer came from the estate of the late Cornelia Warren of Waltham through her executor proposing that certain land could be given to the Commonwealth for the use of the Massachusetts Agricultural College, either for the work in vegetable gardening or for other purposes. After much consultation authority was secured from the General Court to accept this gift with a view to the removal of the Market-Garden Field Station to the new site in Waltham.

The land in North Lexington with the buildings was sold in September, 1924, possession being given October 1, 1924, and the portable effects of the Field Station with its records and personnel was moved to the new location in Waltham.

Under authority given by the Legislature the funds (\$25,000) received from the sale of the North Lexington property have been used in providing new quarters on the land in Waltham. Certain of the old buildings which came with the property have been remodelled and adapted to their new uses and a new office building and greenhouse are being erected.

Goessmann Laboratory.

The Goessmann Chemistry Laboratory was sufficiently near completion so that classes were scheduled there at the beginning of the fall term. It will be recalled that the Legislatures of 1922 and of 1923 appropriated \$300,000 for the construction and equipment of this building. The building was formally dedicated October 3, 1924. All the children of the late Dr. Goessmann were present. Representatives from educational institutions and a number of alumni of the College interested in Chemistry were guests of the College.

The following program was carried out:

Acting President EDWARD M. LEWIS, presiding.

The Building	Dr. Joseph B. Lindsey, '83 Goessmann Professor of Agricultural Chemistry and Head of the Department.
Charles A. Goessmann (Chemist and Philosopher) .	Dr. Frederick Tuckerman '78 of Amherst.
Chemistry and Human Nutrition	Dr. Thorne N. Carpenter '02 Nutrition Laboratory, Boston; Carnegie Institution of Washington.
Chemistry and Agriculture	Dr. Charles A. Browne, Chief, Bureau of Chemistry, United States Department of Agriculture.

Mount Toby.

There has recently been organized an Advisory Committee to co-operate with our Forestry Department in the development and management of the Mount Toby Demonstration Forest. The Committee selected consists of Mr. Andrew C. Warner, Sunderland, Mr. Walter D. Cows, North Amherst, and Mr. Charles H. Beaman, Leverett.

Recommendations for Legislation.

Two amendments to existing laws affecting the college were laid before the Legislature of 1924. One proposed to reduce the tax levied for the inspection of feeds from \$20 to \$15. The reason given for the change was that the present tax is higher than is justified by the work done. The appropriation for this work in 1923 was \$9,000 and the income was \$19,420.

The second amendment sought to take from the Department of Administration and Finance the editorial supervision of research bulletins of the Massachusetts Agricultural Experiment Station.

Both of these bills were referred to the next General Court.

MASSACHUSETTS AGRICULTURAL COLLEGE LEGISLATIVE BUDGET, 1925.

Projects for Permanent Improvement.

1. HORTICULTURAL MANUFACTURES BUILDING, \$60,000.

The importance of utilizing various by-products of the farm which formerly were wasted, such as fruit and vegetables, was emphasized during the war, and under the direction of Prof. W. W. Chenoweth of this institution farmers came to see whereby this saving could to advantage be made permanent. In order to give adequate instruction in the preservation of fruit and vegetable products, a new laboratory building is essential. The plans provide for a one-story building of inexpensive construction, which will furnish laboratories for the various phases of this work.

The pressing need for this building is now generally understood. However, some of the principal considerations may be recapitulated as follows:

(a) The department of horticultural manufactures now has its work widely distributed in four buildings, viz., Flint Laboratory, Wilder Hall, French Hall, and a workshop on the hill near the cold storage plant. This wide scattering of the work is obviously very detrimental to its objective.

(b) The principal teaching is done at Flint Laboratory in rooms which were designed for use by the dairy department. The dairy department needs these rooms and would like to see the department of horticultural manufactures cared for elsewhere as soon as possible.

(c) The present quarters are entirely inadequate for the teaching work. On account of the limited space the department has been compelled to refuse admission to numbers of students. This is perhaps the only department in the institution which has been compelled frequently to refuse admission to students on account of lack of space. All the teaching could be much better organized and more efficiently conducted in a new building designed for this particular work.

(d) It is highly desirable that vigorous research work be undertaken at the earliest opportunity in the field of fruit and vegetable preservation and the manufacture of by-products. A strong demand exists for this work among fruit growers, but the subject is equally important to all consumers of food in Massachusetts.

(e) The department is now carrying on important extension work, but these extension projects need to be strongly supported by effective work at the college, and especially by well-directed research work.

(f) The Massachusetts Fruit Growers' Exchange Association, the Boston Market Gardeners' Association and other organizations have urgently requested this proposed building. This demand from the fruit growers and vegetable growers should be squarely met.

2. TUNNEL FROM POWER PLANT TO STOCKBRIDGE HALL, \$38,500.

The principal argument advanced in support of this project is the recommendation made by French and Hubbard, engineers, who recently made a study of the present heating plan and future development for the same, "that a tunnel be constructed to Flint Laboratory and Stockbridge Hall and the piping arranged so that exhaust steam can be used in these buildings. We are firm believers in tunnels for steam mains of this kind, and believe that when it is necessary to rearrange the underground piping, tunnels should be constructed." We would recommend this both for economy in the long run and on account of convenience in repairs and pipe insulation."

At present none of the underground steam lines are enclosed in tunnels. The result is a high cost of maintenance because of the excessive radiation and because of the difficulty in locating and repairing leaks. Also, at present, the maximum use is not made of exhaust steam; this latter difficulty would be met by the project here outlined.

3. WOMEN'S GYMNASIUM AND EQUIPMENT, \$16,450.

With the increased number of women students attending the College, the need of a women's gymnasium becomes imperative. With the appropriation here requested it is proposed to erect a wooden frame building adjacent to the present Women's Dormitory. Placed in this location it will be unnecessary to duplicate dressing rooms and shower baths. The amount requested will provide for the necessary equipment for the building.

4. ROADS AND WALKS, \$10,000.

In order to secure a system of improved roads and permanent walks on the campus, it is proposed to build small sections of each from year to year. In 1925 it is planned to extend the macadam road, provided in 1923, from the Chapel to the Power Plant, and to lay a granolithic walk from South College to the Drill Hall.

5. LIVING QUARTERS FOR FOREMAN AT TILLSON FARM, \$6,000.

Recently the barn cellar on the Tillson Farm was converted into an incubator cellar by repairing the walls and constructing a suitable roof. These repairs, however, have been partial and it is now proposed to raise the roof in order to provide a two-story building. The upper floor will furnish living quarters for the foreman and the main floor will be used as an experimental laboratory, egg room, operating room, office and shop. These improvements have already been delayed beyond the point of economy in operation.

6. EXTENSION OF PRESENT ENCLOSED ATHLETIC FIELD AREA, \$22,500.

It is proposed to extend in a southerly direction the present athletic field and to include in the enlarged area twelve tennis courts and two skating rinks, as well as to relocate the running track. The estimate covers the cost of extending the fences and grading and draining this area.

7. OTHER PERMANENT IMPROVEMENTS FOR ATHLETIC FIELD AREA, \$10,500.

This project is connected with that preceding and is intended to provide the permanent improvements for the enlarged field. The principal items are:

1. Piping water to the field for sprinkling, flooding, and drinking purposes.
2. Installing wire fencing for tennis courts.
3. Building walls for skating rinks.
4. Moving the quarter mile track.

8. TUNNEL TO FIRST PIT SOUTH OF POWER PLANT, \$4,615.

This project has been under consideration for several years but has not been pressed more urgently because of other demands. Its purpose is to provide for an underground system of steam piping for a distance of sixty feet from the wall of the power plant, extending to a point where the steam mains for the south side of the campus branch.

9. NEW STEAM LINE FROM EAST EXPERIMENT STATION TO MICROBIOLOGY BUILDING, \$4,705.

This project contemplates replacing a section of underground pipe line which is now in poor condition. The new line would be 385 feet shorter than the present one, thus effecting greater economy in operation.

10. LIVESTOCK REPLACEMENT, \$4,000.

In order to maintain satisfactorily the present pure bred strains of livestock including horses, cattle, sheep and swine, it is necessary to buy certain animals each year. The funds received from the sale of stock would be sufficient to maintain the inventory on a satisfactory basis. Under present conditions, however, it is necessary from time to time to seek special appropriations for this purpose. In 1925 the amount requested is \$4,000.

11. FENCING FRUIT PLANTATIONS, \$3,000.

The fruit plantations of the Horticultural Department are every year subject to serious raiding, besides the constant loss of fruit from visitors who stroll through the orchards and vineyards and help themselves to small quantities of fruit. An attempt has been made to prevent the raiding by patrolling the orchard. Loss due to the second cause cannot be stopped in this manner. It is believed that both types of loss can be largely prevented by fencing the main fruit plantations. The present estimate contemplates enclosing only such plantations as are now bearing fruit. Nine thousand linear feet of fence would be provided by the amount asked under this item.

12. CULVERT FOR BROOK IN RAVINE, \$2,505.

In order to provide adequate storage place for the large supply of coal which now has to be carried during part of the year, it is necessary to construct a culvert over a section of the stream which runs through the ravine adjacent to the Turbine House. The proposed culvert would be 175 feet long, four feet high and five feet wide, and can be constructed at an estimated cost of \$14.32 per linear foot.

13. REFRIGERATING PLANT AT PAIGE LABORATORY, \$2,000.

For years it has been impossible satisfactorily to maintain the animal and poultry disease specimens and to conserve the various kinds of diagnostic sera made in the Department of Veterinary Science and Animal Pathology. Two small re-

frigerators which require daily icing are now used but are inadequate for the present demands. The addition proposed is necessary in order to save valuable perishable materials.

14. ADDITIONAL LAND AT THE CRANBERRY STATION, EAST WAREHAM, \$1,000.

The total area of land, the purchase of which is contemplated by this item, is sixteen acres in the larger parcel; one acre, forty rods, in the smaller. The latter area is needed for the purpose of straightening the present boundary and preventing possible undesirable neighbors. The former area is required for three purposes, namely:

As source of sand for sanding the bogs.

Turf for building dams, dikes, and embankments.

An area of some eight acres, a part for enlargement of the blueberry plantation's work, another part for testing new varieties of cranberries, and engaging ultimately in formal breeding work.

REPORT OF THE DEAN.

Much of the work of the Dean's office during the year just ended had to do with administrative matters of scholarship, schedule and student welfare.

From the very start every effort was made to have the new men begin right. To bring this about a new departure was taken this year through the introduction of a "Freshman Week." The schedule for this week was carefully planned with a view to introducing the entering student to his new environment in the shortest possible time with the least possible upset. Freshmen were asked to report three days ahead of the date set for the opening of college. This time was used for lectures on College Life, important college regulations, fraternities, scholarship, methods of study, campus employment and schedules. Mental tests, under the direction of the Department of Education, were also given during this period. These preliminaries were over when the members of the three other classes arrived on the campus for the formal opening of college, which came on Thursday afternoon. The time from the opening of college to the end of the week was given over entirely to class registration, lesson assignments and fraternity rushing. No rushing was permitted after this period. Accordingly, regular class work began the second week without any interference or loss of time.

All Freshmen were assigned to Advisers who acted as counselors and guides, and through whom almost personal attention was given to every new student. This advisory scheme, now in operation for a number of years, has given general satisfaction.

The advisory group this year was made up of the following members of the faculty chosen especially because of their sympathetic interest in students and their problems:

Halliday, Raymond.
Julian, A. N.
Lanphear, M. O.
Machmer, Wm. L.
Mackimmie, A. A.
Moore, F. C.

Phillips, A. W.
Porter, W. R.
Rand, F. P.
Rice, V. A.
Yount, H. W.
Skinner, Miss.

A preliminary scholarship report on all Freshmen was received in the Dean's Office at the end of the third week. This report helped to size up the men and enabled the advisers to work more effectively with their advisees. About three weeks later another more complete scholarship report was received. This report was mailed to the parent directly through the adviser. In this way co-operation between parent and adviser was established. This essential relation proved very helpful.

The Sophomores, Juniors and Seniors were almost entirely handled by the writer personally as far as scholarship was concerned. A complete report of their scholastic work was received from the instructors about six weeks after the open-

ing of each term. If this report was not satisfactory the student was called into personal conference. Good results followed from such conferences.

While the scholarship problem is still with us and undoubtedly ever will be, yet we feel that it is receiving careful and sympathetic attention and that as a result, our efforts in behalf of deserving students will become increasingly effective.

The regulation introduced last year withdrawing the cut privilege from Freshmen was, at the request of the Student Senate, extended to include the members of the Sophomore class. The two lower classes are now working under this system, which seems to meet with very general approval from both faculty and students.

Recognizing that college teaching can and ought to be better, a distinct beginning was made last winter to bring this about. A series of five teachers' meetings were held at intervals of two weeks to consider methods of teaching and ways and means for improving teaching practices at the Massachusetts Agricultural College. The meetings were in charge of members of the staff and were very suggestive and helpful.

The death of Professor Philip B. Hasbrouck, Registrar of the College since 1905, on July 19, 1924, threw a new duty on the writer, who was appointed Acting Registrar. This meant the handling of the Dean's and Registrar's work under one head. The undertaking was rather an ambitious one and has necessarily forced the adoption of a "carry on" policy. Outstanding new ventures could not be undertaken. The clerical force in both the Dean's and Registrar's Offices deserves great credit for its loyalty and willingness to carry added responsibilities.

The student morale was good. The finest spirit of whole-hearted co-operation was noticeable on every hand. Buoyed up by this undivided support we were able to carry rather easily the very numerous burdensome duties of an unusually exacting year.

WM. L. MACHMER,
Assistant Dean.

REPORT OF THE DIRECTOR OF THE EXTENSION SERVICE.

The year 1924 has seen the further development and carrying out of extension policies and plans which have been the basis of work in the past. Projects have been developing with each year's experience so that they are close to the needs of the farms and rural homes of the state. The underlying needs of agriculture and home-making must always be the starting point in our work. These have not changed materially during the year.

The agriculture of Massachusetts is, however, passing through an adjustment period. High prices during and immediately following the war enabled many inefficient farmers to make profits. Those days are over. Dairymen, poultrymen and market gardeners are finding it necessary to reduce the costs of production if there is to be a profit at the present market prices. Our service to them must be to enable them to reduce costs of production so that they can still compete with farmers in other areas who are selling in our markets. The successful low-cost producer still has good opportunity, but the day for the inefficient high-cost producer has gone. Readjustment is a bitter process to those who cannot make the changes, but it is inevitable. Fortunately, the majority seem to be finding ways of meeting changed conditions, and complaints come largely from those who do not yet sense the nature of the change. It is a matter of hopeful significance that Massachusetts producers see the futility of trying to raise prices by artificial means and are looking to careful management of their own farms for salvation.

The war brought greater spending power to the majority of city dwellers who at once converted this into ampler standards of living. Rural homes are not so easily provided with even the ordinary comforts which city populations enjoy. Educational assistance to country home-owners to make their homes as attractive and enjoyable as those in the city is much in demand. The call for educational service in clothing and textiles has grown beyond our capacity to meet it. With the filling of the vacancy in our staff, work in nutrition can again be resumed, and the time of the specialist is already booked for months to come.

Boys and girls remain in club work longer than formerly. This is evidence of a feeling that values received are greater. The out-of-the-way corners of the rural sections are being studied more carefully, and the opportunity for club activities is reaching those boys and girls who most need it.

The most important staff-change of the year has been the filling of the position of Extension Specialist in Nutrition, vacant since the summer of 1923. Miss Mildred L. Wood has taken up this work, coming from county and city extension work in Iowa and Minnesota, and from study in Teachers College, Columbia. It is a common observation that extension work in nutrition is less spectacular than in other branches, and appeals primarily to thoughtful home-makers who are conscious of the importance of diet in the family welfare. It is a project which cannot be reported in as vivid a manner as some others because it is not as susceptible to exhibit as others.

Professor H. F. Tompson resigned from the position of Extension Specialist in Vegetable Gardening in order to go into business, and was succeeded by Professor R. M. Koon, who came to us from Delaware. Professor Joseph F. Whitney resigned from the position of Extension Specialist in Landscape Gardening to undertake professional work with the Mariemont Company in Cincinnati, Ohio, and the position is still vacant. Miss Dorothy Murdock resigned from the position of Assistant State Leader of Junior Extension work in order to undertake the practice of home-making, and was succeeded by Miss Harriet M. Woodward, who came to us from home demonstration work in New Hampshire. Professor Frederick E. Cole resigned from the position of Extension Specialist in Pomology to become Manager of the Nashoba Fruit Growers, and was succeeded by Professor Wilbur H. Thies, who came to us from Michigan Agricultural College.

Much attention has been given to teaching methods, in order to reach the larger groups. We have found much demand from the more vigorous and progressive farmers and home-makers, but too often those who most needed to change their practices to survive under present competitive conditions were the slowest to sense the need. The year has marked progress in this effort. A more complete statement of this will be included in Part VI of the annual report of the Massachusetts Agricultural College.

In July the Extension Service issued a cautionary letter relative to the proposed New England Dairy System. It was felt that many farmers would be tempted to join it expecting monopoly profits and high prices. The era of high prices for milk in Massachusetts has passed. The prices of the future will be based on the reactions of supply and demand, as the actual net prices have been for the past few months. The warning from the College received very widespread publicity and much adverse criticism. It is perhaps sufficient to report that the bitterest critic of the College for its position is now advocating the very basic concept on which the warning was founded. It is our conviction that the warning, which was issued simultaneously and in the same form by the Director of Extension in Vermont, saved hundreds of thousands of dollars to the farmers of New England, and prevented the undertaking of a co-operative venture which was unsound in its initial plans. It should be noted, however, that the plans for the New England Dairy System have been revised, and in its ultimate form the organization has a chance to prove of substantial benefit to its members.

Relationships with co-operating agencies have been excellent, and during the year have been developed to better efficiency. This is true alike of the State Departments of Agriculture and Conservation, and with one exception of the County Extension Services.

The county extension organizations have maintained excellent effectiveness and morale. We believe more firmly than ever that a co-operative program of extension work which utilizes the college as a resource agency and the county staffs as the agencies for direct application is most effective. Supporting this is the United States Department of Agriculture, the largest resource organization as well as the largest research organization in the world.

Co-operation with commodity organizations is stronger than ever, with mutual benefit. Educational programs can be carried forward very effectively through the membership activities of such organizations. It is the plan and practice of the

Extension Service to look to such organizations for counsel on the basic needs of the industries which they represent.

We are under very great pressure for materials and leadership in the home-management project. The need of a full-time specialist in this field is urgent. It is to be hoped that the various budgetary and appropriating agencies can find a way to create this new position, which is the only one requested in our budget for the year 1925.

In summary, the year shows marked gain in teaching efficiency, in numbers reached, in understanding of underlying problems, and in the development of materials to meet needs. A detailed report on projects will be found in Part VI of the Report of the Massachusetts Agricultural College.

JOHN D. WILLARD,
Director of the Extension Service.

REPORT OF THE DIRECTOR OF THE EXPERIMENT STATION.

One of the economic lessons gained from the period of agricultural depression through which we are happily passing is that farmers in any given section are in competition with all other farmers who attempt to reach the same market. Massachusetts dairymen are in serious competition with the dairymen of Northern New England. Similarly the potato growers of Massachusetts must compete with those of Aroostook County, Maine; and unless they can place potatoes on the market at as low a cost as can their competitors naturally they will lose their market. With few exceptions, of which the Cape Cod cranberry is the most significant, the price at which our Massachusetts farmers must sell their products is determined by the total crop as produced in competing sections.

Self-evidently, it is impossible to confine to the borders of a single state the benefits of any agricultural research. Seldom can agricultural improvements be patented, or the methods of effecting such improvement be copyrighted. Such action, even if possible, would be undesirable, and not in the interests of public welfare. The results of all experiment station work regardless of where carried on are available to all farmers. Even though we must recognize this, it is nevertheless incumbent on the Massachusetts Station to direct its best efforts to bettering the competitive position of Massachusetts farmers. This it is attempting to do.

The branches of Station work in which distinct service is being rendered to Massachusetts agriculture as distinguished from competing agriculture, are shown in the following paragraphs:

1. *All Research Studies on Plant Diseases and Insect Enemies of Vegetation.*—Because of the fact that development of these obstacles to successful production is so profoundly affected by environment, this research work must be local. Work carried on during the year includes studies of the squash vine borer, the squash bug, the second generation of the codling moth, the hatching dates of a number of scale insects, study of insects affecting the cranberry, and control studies on the onion thrips. In plant diseases, study of carrot blight, of tobacco root rot, of cucumber mildew under glass, of scab and black rot of apples, of onion smut, and of tobacco wildfire are included in the year's operations, together with some co-operative study of certain cranberry diseases carried on jointly with the United States Department of Agriculture.

2. *Most Soil Management and Plant Nutrition Studies.*—These are mainly local in their application, even though the research may develop fundamental principles of wide application. The work of the year includes projects in soil management and fertilization of orchards, study of plant food relations in permanent pasture, and a new series of soil management studies for onions and tobacco. The net result of this work, when and as it is brought to successful completion, will be to better to a significant degree the competitive conditions under which our farmers work.

3. *Certain Studies in Animal Nutrition.*—The most significant at the present moment is investigation of substitutes for milk in the rearing of dairy calves. The situation in the Massachusetts dairy industry is one which puts a high value on

fluid milk, and which necessitates high producing cows in the dairy herd. The latter fact is favorable, the former highly unfavorable, to the breeding of high quality dairy cows. Apparently our Massachusetts farmers will not be able to replace their herds unless substitutes for milk be found. This project, however, when successfully completed, may develop fundamental principles of almost universal application.

4. *Local Studies on Markets and Marketing.* — The most important work of the year was study of costs of marketing Massachusetts apples. The object here was to give to the Massachusetts orchard industry the facts on which more economical operation may be based.

5. *Poultry Disease Studies, with Particular Reference to those Typical of Intensive Poultry Industry.* — The disease problem in congested regions differs significantly from that in other regions. This makes it necessary that the Station give good service in order that the industry may be maintained on a sound basis.

There are many other projects which have a much wider application. The work of the Department of Poultry Husbandry in breeding high egg laying strains of Rhode Island Reds illustrates the point. The increased economy which this high producing stock makes possible will be nearly as great an advantage to the competitors of Massachusetts poultrymen as to Massachusetts poultrymen themselves. Ultimately, of course, it can have but one result — to make possible the production of eggs at a lower cost than at present. Similarly, much of the study in agricultural economics, research on the properties of feeding stuffs, and fundamental studies in plant development are of ultimate fundamental significance to the people as a whole, rather than to any restricted group.

Demand versus Need for Research Work.

The above brings out a most important point. Normally the ability of the Experiment Station to undertake research work in any line depends on apparent demand for the same. Practically the need for this research antedates the demand, even by a score of years. The most successful research is that which avoids trouble, rather than merely remedies it after it occurs. If the work established two years ago on certain problems incident to tobacco culture had been started twenty years ago; and if the work on white diarrhoea control of poultry could have been instituted before the disease became prevalent, the farming industry of Massachusetts would have been saved from great losses. This represents one of the difficult problems of Station administration — to secure funds in support of fundamental research for which there may be no apparent demand, but which may be the most productive research possible, on account of its anticipating future needs. The fact that Massachusetts has in general been astonishingly liberal in its appropriations to its Experiment Station is a cause both for gratification, and increased sense of responsibility to the tax payers of the State.

Conditions affecting Station Work.

In the attempt to make the work of the Station apply most fully to the needs of Massachusetts, the fullest co-operation has been received from members of the Station staff. There is, however, a growing lack of contact between the Station men and those who should form the main clientele of the Station, — that is, the farmers of the State. This loss of contact is caused primarily by change in the character of the Station work, and secondarily by the fact that the Extension Service now serves as the liaison organization between the College and Massachusetts farmers. Further study needs to be given to the problem, for the fullest responsibility to the people of the State will not be obtained unless our workers are in contact with those requiring our research service.

Most of the conditions experienced during the year have been favorable. Great progress has been made in improving and equipping the various farm areas now available for Station work — the new Brooks Experimental Farm, the Harlow Farm for orchard experimental work, and the Tillson Farm for poultry breeding. The transfer of the Market Garden Field Station from North Lexington to Waltham gives to this branch of the institution greatly increased opportunities for effective

research. The increase of personnel at the Cranberry Station has likewise increased opportunities in its work.

Of unfavorable developments during the year there are two which are worthy of notice. The first is the very large turnover in the lower paid positions on the Station staff. The total of full time workers now in the service of the Station is forty-five. There were ten resignations during the course of the year, most of these being caused by dissatisfaction with the low salary schedule, coupled with the ability to find better opportunities elsewhere. This condition was reported to the Trustees in 1922. The second unfavorable condition is in the publication of results of research. Not for years has the Station had such a poor record. The conditions bringing about this unfavorable development are those described in my last annual report.

SIDNEY B. HASKELL,
Director of the Experiment Station.

REPORT OF THE DIRECTOR OF THE GRADUATE SCHOOL.

Agriculture is, by common consent, the noblest of the professions. To exalt it and to hold it in its proper place in the eyes of the world should be the goal of every individual genuinely interested. Those engaged in agriculture and especially the leaders, should have real pride in their calling. Moreover they should be broadly trained. They must meet other professional classes on the same footing; they must develop a culture equal to any profession, a standard of life accepted by all conditions of society, and a mentality that will reflect credit and be conspicuous in all callings in which they may participate. Such is the objective of graduate work in agriculture.

The school flourishes and is accomplishing much as measured comparatively with other graduate schools, but we seek to accomplish much more in an effort to realize the full significance of the goal set above. It is pertinent to know what is being done by our graduate students. This can in a very meagre way be illustrated by the theses submitted by the candidates for higher degrees last June.

Mr. Stanley B. Freeborn received the degree of Doctor of Philosophy. He presented a thesis on "The Mosquitoes of California." This study extended over several years. Mr. Freeborn is connected with the University of California. His study has universal application.

Mr. John G. Archibald received the degree of Master of Science and presented a thesis considering "The Digestibility of Treated Grain Hulls for Domestic Animals." This was an extensive study within the Experiment Station and aims to make available a wider range of animal foods.

Mr. Roland W. Rogers, receiving the degree of Master of Landscape Architecture, offered a thesis in which he has elaborated grounds and buildings for an agricultural school in Albania. This has been done in conjunction with and at the request of those responsible for the enterprise.

Mr. Raymond A. Mooney, receiving the degree of Master of Science, has made a study of those "Physical Properties of Fertilizer Materials" which are constantly annoying to individuals handling fertilizers.

Mr. Stanley W. Bromley received the degree of Master of Science and offered as a thesis a study of "The External Anatomy of the Horse Fly." Such a study furnishes a basis for applications in eradication.

Mr. Warren B. Mack, who is connected with Pennsylvania State College, was the recipient of the Master of Science degree. He contributed as a thesis a study of "The Growth and Bearing Habit of Apple Spurs." The purpose of this study was to gain some knowledge of the peculiar habits of apple bearing that are familiar to those raising apples.

Such work means much to agriculture. While it represents intensely specialized investigation, yet it is the only method of moving ahead in any particular field.

Of course it is impossible to present in this connection the studies of graduate students apart from the above aspect of their activities, for graduate work is largely individual and its procedures independent.

CHARLES E. MARSHALL,
Director of the Graduate School.

REPORT OF THE DIRECTOR OF SHORT COURSES.

The work of the short courses is being carried on along the lines developed by former Director Phelan, with few apparent adjustments required at present. This report must deal largely with results secured during his tenure of office, for the present director did not assume charge until late in September. It is a pleasure to record here the fine type of organization as to curriculum, student morale, administrative machinery, and instructors, which has been built up by my predecessor during the past seven years.

Two-Year Course.

One cannot help feeling that a distinct educational opportunity has been provided with the development of the two-year short course. I believe it supplies a needed educational opportunity which, if broadly realized, will enable the College to constantly recruit the ranks of our agricultural population most directly. I say this because I do not view the decreasing enrollment figures in this course with alarm. In fact, with the Veterans' Bureau trainees no longer a contributing factor because of the practical completion of the government's rehabilitation program, we find the entering class this fall registers a slight increase. I am inclined to believe this year marks the ebb of the tide and while no great inflow should result, classes of a more normal size can be expected.

It is a source of much satisfaction to observe the capable work being performed by so many of the graduates in their various fields of occupation. Figures recently secured indicate that a large majority of the men and women, approximately eighty-six per cent, are actually engaged to-day in productive agricultural pursuits.

We have no slight problem to secure the right kind of summer training jobs for the students' practical work of six months in the freshman year. Ninety positions must be found for this year's class alone. Many of the best farmers in the state are assisting us in this program, not only by taking students to meet their labor requirements of the summer, but in a number of cases they find such men highly desirable for permanent positions after graduation. We plan to lay even greater stress on the practical training of the two-year students during this summer period, with the idea that students demonstrating a high standard of farm ability may offset minor class-room discrepancies. On the other hand a few students easily maintain good class grades, only to show little zeal, initiative, or skill in their farm training. No parent should expect the College to pass such men with its approval as vocationally trained in agriculture. They belong elsewhere in industry.

Mental tests given to the freshman group this year by the college department of education indicate a large percentage of the students have had much more than the minimum preparation required for the course. Arrangements were made for all male students to take the regular college physical examination, hitherto required only of members of athletic squads. This was conducted by Professor Curry S. Hicks, and the data secured has been helpful already in informing students of physical limitations, either chronic or corrective.

Tabulation of Students by Majors studied.

Animal Husbandry, 47; Dairy Manufactures, 9; Floriculture, 19; Horticulture, 18; Pomology, 29; Poultry, 29; Vegetable Gardening, 9; General Women's Course, 5.

Two-Year Course Enrollment for the Past Five Years.

1919, 209; 1920, 295; 1921, 302; 1922, 274; 1923, 169.

Winter School.

A new short-course plan was put in operation by the Department of Floriculture to provide a more balanced training in flower-growing. It was planned to alternate this Florist School with a Nursery School, scheduled for the coming

year. Not enough students registered to make this possible. A special course in Fruit Growing will be given in the winter of 1925 which should prove of interest to the fruit men of the state. The two week units in Dairy Manufactures, including ice-cream making and milk testing continue to prove popular, providing a short intensive course of lessons. New unit courses in milk plant operation and milk inspection replace butter-making and market milk as offered last year.

Summer School.

Collegiate credit for work taken in the summer school was given for the first time this year. This will undoubtedly interest many teachers of the state who wish to continue their professional training along lines of study we are excellently equipped to carry on. To many teachers of agriculture the new credit system will serve to meet state requirements for advanced study.

Placement Training and Supervision.

For the Veterans' Bureau field work three men are still employed under government salary. This force is being reduced gradually as the federal training program for ex-service men approaches completion.

The many problems in placing two-year students for summer training are being handled by Mr. Paul W. Viets with tact and understanding. He is making many valuable contacts with agricultural organizations to secure the best possible places and achieve the maximum results for both student and farm operator.

ROLAND H. VERBECK,
Director of Short Courses.

TABLE I. — NEW APPOINTMENTS.

A. In the Academic Departments.

- Instructor in Physical Education: Lorin E. Ball, B.Sc., Massachusetts Agricultural College, 1921.
 Instructor in Physical Education: Edward L. Bike, B.Sc., Massachusetts Agricultural College, 1924.
 Assistant Professor of Landscape Gardening: Prentiss French, A.B., Williams, 1917; M.L.A., Harvard, 1921.
 Instructor in French: Raymond Halliday, A.B., Brown, 1920.
 Instructor in English: Belding F. Jackson, B.Sc., Massachusetts Agricultural College, 1922.
 Instructor in Agronomy: Willard P. Jones, B.Sc., University of Wisconsin, 1923.
 Assistant Professor of Home Economics: Helen Knowlton, A.B., Mt. Holyoke, 1903; A.M., Columbia, 1924.
 Acting President: Edward M. Lewis, A.B., Williams, 1896; A.M., Williams, 1899.
 Instructor in Microbiology: John B. Nelson, B.Sc., Massachusetts Agricultural College, 1917; A.M., Harvard, 1923; Ph.D., University of Missouri, 1924.
 Assistant Professor of Poultry Husbandry: John W. Patton,¹ B.Sc., Cornell, 1911; D.V.M., Texas Agricultural and Mechanical College, 1921; M.Sc., Kansas State College, 1924.
 Instructor in Chemistry: Arthur W. Phillips, B.Sc., Tufts, 1915; A.M., Harvard, 1921.
 Instructor in Zoölogy: Gordon C. Ring, B.Sc., Wesleyan, 1923; A.M., Wesleyan, 1924.
 Instructor in Farm Law: Harold W. Smart,¹ LL.B., Boston University, 1918.
 Director of Short Courses: Roland H. Verbeck, B.Sc., Massachusetts Agricultural College, 1908.
 Assistant Professor of Microbiology: Chester H. Werkman, B.S.A., Purdue, 1919; Ph.D., Iowa State College, 1923.
 Librarian: Basil B. Wood, A.B., Brown, 1905.

¹ Temporary for one year.

B. In the Experiment Station.

Investigator in Botany: Theodore T. Ayers, B.Sc., Pennsylvania State College, 1924.

Investigator in Chemistry: Gerald M. Gilligan, B.Sc., Massachusetts Agricultural College, 1921.

Curator, Department of Botany: Gladys I. Miner.

C. In the Control Service.

Specialist in Poultry Disease Elimination: Patrick E. Bransfield, B.A., Wesleyan, 1912.

Analyst: George B. Dalrymple.

Technical Assistant: James J. McDermott.

Analyst: Alice H. Norcross.

D. In the Extension Service.

Extension Professor of Farm Management: Fayette H. Branch, B.Sc., Cornell 1914.

Extension Editor: John A. Crawford, B.Sc., Massachusetts Agricultural College, 1920.

Extension Professor of Vegetable Gardening: Ray M. Koon, B.Sc., Pennsylvania State College, 1914; M.Sc., University of Delaware, 1923.

Assistant Extension Professor of Pomology: Wilbur H. Thies, B.Sc., Michigan Agricultural College, 1919.

Assistant Extension Professor of Nutrition: Mildred L. Wood, A.B., Rockford College, 1912.

Assistant State Club Leader: Harriet M. Woodward, B.Sc., Framingham Normal, School, 1922.

E. Miscellaneous.

Matron, Infirmary: Mrs. Mary Macrae.

Curator, Department of Chemistry: Ural V. Martin.

TABLE II. — SPEAKERS FOR THE YEAR.

*A. Speakers at Assembly for the Year ending Nov. 30, 1924.***1923**

Dec. 6. Mr. Homer B. Hurlbert, Springfield.

Dec. 13. Mr. Ray Stannard Baker, Amherst.

1924

Jan. 2. Mr. Samuel T. Dana, Amherst.

Jan. 9. Mr. William G. Baxter, Hartford, Conn.

Jan. 16. Dr. Harry F. Ward, New York City.

Jan. 23. Mr. Henry Bond, Brattleboro, Vt.

Jan. 30. Prof. James W. Crook, Amherst.

Feb. 6. Prof. Irving Fisher, New Haven, Conn.

Feb. 13. Student Forum.

Feb. 20. Dean Edward M. Lewis, M. A. C.

Feb. 27. Freshman-Sophomore Debate.

Mar. 5. Prof. Thomas E. Elder, Mt. Hermon.

Mar. 19. President Ralph D. Hetzel, Durham, N. H.

Mar. 26. Mayor Edward J. Woodhouse, Northampton.

Apr. 2. Rev. Edwin B. Robinson, Holyoke.

Apr. 9. Prof. Robert Frost, Amherst.

Apr. 16. Dr. Charles F. Remer, Cambridge.

Apr. 23. Dr. Alfred Sze, China.

Apr. 30. Mr. Frank Morrison, Washington, D. C.

May 14. Student Forum.

May 21. Burnham Declamation Contest.

Sept. 17. Opening Assembly.

1924

- Sept. 25. Acting President Edward M. Lewis.
 Oct. 2. Rev. Edwin B. Robinson, Holyoke.
 Oct. 9. Hon. George D. Chamberlain, Springfield.
 Oct. 16. Mr. Roland A. Gibson, New York City.
 Oct. 23. Mayor Edward J. Woodhouse, Northampton.
 Oct. 30. Mrs. Lucia Ames Mead, Brookline.
 Nov. 6. Student Forum.
 Nov. 13. Motion Pictures, Massachusetts Forestry Association.
 Nov. 20. President George D. Olds, Amherst.

B. Speakers at Sunday Chapel for Year Ending Nov. 30, 1924.

1923

- Dec. 9. Dr. Samuel A. Eliot, Boston.
 Dec. 16. Dr. B. H. Lockhart, Manchester, New Hampshire.

1924

- Jan. 6. Bishop Edwin H. Hughes, Malden.
 Jan. 13. Rev. S. Ralph Harlow, Northampton.
 Jan. 20. Rev. John Haynes Holmes, New York City.
 Jan. 27. Rev. John C. Seymour, Holyoke.
 Feb. 3. Mr. Alfred E. Stearns, Andover.
 Feb. 10. Dr. D. Brewer Eddy, Boston.
 Feb. 17. Rev. Barrett P. Tyler, Brookline.
 Feb. 24. Dr. Sidney E. Goldstein, New York City.
 Mar. 2. Rev. Alfred Grant Walton, Stamford, Conn.
 Mar. 9. Rev. Marshall Dawson, Storrs, Conn.
 Mar. 23. Rev. John Herman Randall, New York City.
 Mar. 30. Rev. Frank W. Padelford, New York City.
 Apr. 6. Pres. John M. Thomas, State College, Pa.
 Apr. 13. Prof. Rufus M. Jones, Haverford, Pa.
 Apr. 20. Rev. Nehemiah Boynton, New York City.
 Apr. 27. Rev. John B. Hanna, M. A. C.
 Nov. 2. Bishop Francis J. McConnell, Pittsburgh, Pa.
 Nov. 9. Rev. John Howard Melish, Brooklyn, New York.
 Nov. 16. Bishop Thomas F. Davies, Springfield, Mass.
 Nov. 23. Rev. John Herman Randall, New York City.

TABLE III. — ATTENDANCE.

	REGISTRATION NOV. 1, 1923.			REGISTRATION NOV. 1, 1924.		
	Men.	Women.	Total.	Men.	Women.	Total.
<i>A. In Work of College Grade.</i>						
Graduate Students	58	5	63	53	9	62
Senior Class	87	7	94	79	4	83
Junior Class	71	4	75	99	14	113
Sophomore Class	120	17	137	100	10	110
Freshman Class	112	13	125	152	31	183
Special Students	10	7	17	9	11	20
Totals	458	53	511	496	75	571
<i>B. Short Course Enrollment.</i>						
Two-Year Course, second year . . .	84	5	89	60	8	68
Two-Year Course, first year . . .	68	12	80	85	9	94
Vocational Poultry Course	4	—	4	—	—	—
Two-Year Course, special students .	—	—	—	1	1	2
Totals	156	17	173	146	18	164
<i>C. Other Short Course Enrollment.</i>						
School for Country Clergymen . . .	32	2	34	—	—	—
Winter School	68	16	84	72	11	83
Summer School	17	110	127	55	89	144
School for Florists	7	4	11	—	—	—
Totals	124	132	256	127	100	227

D. Convention Registration.

1923.

1924.

Polish Farmers' Day	100	200
Farmers' Week and Annual Poultry Convention	2,500	3,000
Junior Boys' and Girls' Prize Winners' Camp	75	100
Extension Workers' Conference	85	100
Sheep Breeders' Conference	75	—
Middlesex County Club Champions	200	—
Feed Dealers' Conference	—	40
Tri-State Conference on Fruit Growing	100	—
Hampden County Club Members	200	100
Bankers' Conference	—	20
Women's Clubs	—	80
Lawn Day	—	30
Greenkeepers' Day	—	35
Boys' Camp	—	50
Totals	3,330	3,755

TABLE IV. — LEGISLATIVE BUDGET, 1924.

ITEMS.	Requested, 1924.	Appropriated.
Tunnel for steam line from power plant to Stockbridge	\$39,000	—
Horticultural Manufactures, laboratory and equipment	60,000	—
Miscellaneous buildings and improvements	34,650	\$5,650
Addition to Rural Engineering Building and Equipment	17,500	15,000
Roads and Walks	10,000	1,000
Buildings for Market Garden Field Station at Waltham	25,000	25,000 ¹
Totals	\$186,150	\$46,650

¹ Subject to sale of Lexington plant at \$25,000.

TABLE V. — CURRENT ACCOUNT, STATE FUNDS.

	Requested 1924.	Appropriated 1924.	Deficiency Appropriation (Balance from 1923).	Expended 1924.	Balance.
Personal Services:					
Administration	\$38,635	\$39,600	—	\$37,314 73	\$2,285 27
Instruction	205,069	196,000	—	192,016 04	3,983 96
General Maintenance	127,000	123,000	\$520 26	127,820 45	—3,700 19
General Maintenance Emergency	—	600	—	—	—
Experiment Station	87,935	75,000	141 58	74,699 03	442 55
Extension Station	55,788	48,525	54 59	48,711 99	—132 40
Market Garden	6,000	6,000	—	5,427 42	572 58
Short Courses	60,357	58,500	—	58,008 24	491 76
Travel, Office and other Expenses	47,375	42,500	804 76	42,237 23	1,067 53
Teaching, lab. supplies and equip.	56,000	54,000	382 62	55,321 52	61 10
Teaching, lab. supplies and equip. emergency	—	1,000	—	—	—
Experiment Station supplies, equip. and publications	17,680	15,000	631 68	15,613 23	18 45
Experiment Station travel and office expenses	4,370	4,000	78 28	3,750 97	327 31
Extension Service supplies, equip., travel, etc.	40,400	33,200	363 23	34,265 80	—702 57
Short Courses	15,350	12,000	512 75	11,958 60	554 15
Heat, light and power	65,000	65,000	223 07	44,081 40	21,141 67
Farm and Grounds	20,000	20,000	1,450 96	17,938 66	3,512 30
Repairs, Ordinary	25,000	25,000	452 24	25,475 22	—22 98
Replacements	27,500	20,000	1,014 25	22,368 52	—1,354 27
Market Gardening	4,400	4,200	115 35	4,813 09	—497 74
Fertilizer Law Control	13,500	13,500	13 20	13,387 60	125 60
Poultry Disease Law	8,000	8,000	54 34	8,074 20	—19 86
Milk-testing inspection law	600	600	—	510 01	89 99
Trustees' Expenses	1,200	1,200	15 95	1,193 03	22 92
Printing Reports	2,000	2,000	782 09	2,257 61	524 48
Commercial Feedstuffs	9,500	9,000	18 20	9,095 30	—77 10
Emergency Fund	10,000	—	—	—	—
	\$948,659	\$877,425	\$7,629 40	\$856,339 89	\$28,714 51
Emergency Fund appropriated but not used	—	3,400	—	—	—

TABLE VI. — STATISTICS OF FRESHMEN ENTERING MASSACHUSETTS AGRICULTURAL COLLEGE, SEPTEMBER, 1924.

A. Home Addresses of Students (classified by Towns and Cities).

Abington	1	Hadley	1	Plainfield, Ct.	1
Amherst	10	Hampden	1	QUINCY	4
Arlington	3	Hatfield	1	Reading	1
Attleboro	1	HAVERHILL	1	Red Bank, N. J.	1
Ayer	1	Hingham	2	Rockland	2
Bellingham	1	Holden	3	SALEM	1
Belmont	3	Holliston	1	Shelburne	1
Berlin	2	HOLYOKE	12	Sherborn	1
Bernardston	1	Hopedale	1	Shirley	1
BEVERLY	2	KEENE, N. H.	1	SOMERVILLE	1
Boston	5	LAFAYETTE, IND.	1	Southborough	1
Bridgewater	1	LAWRENCE	1	South Hadley	1
BROCKTON	2	Lenox	1	SPRINGFIELD	5
Brookfield	1	Littleton	3	Sterling	1
CAMBRIDGE	2	Longmeadow	1	Stoneham	1
CHELSEA	2	LOWELL	3	Stow	1
Cheshire	1	LYNN	1	Sutton	1
CHICPEE	2	MANCHESTER, N. H.	1	Swampscott	1
Closter, N. J.	1	Marion	1	Switzerland	1
Colrain	1	Marshfield	1	TAUNTON	2
Conway	3	Maynard	1	Templeton	1
Dalton	1	Medfield	1	Turner, Me.	1
Danvers	2	Millis	2	UTICA, N. Y.	1
DETROIT, MICH.	1	Monson	1	WALTHAM	3
East Longmeadow	1	Montague	3	Ware	1
EVERETT	1	Natick	1	Watertown	1
Fair Haven, Vt.	1	NEW BEDFORD	1	Wellesley	2
FALL RIVER	2	NEWBURYPORT	1	West Brookfield	1
Falmouth	1	NEWTON	1	WESTFIELD	2
Framingham	3	Norfolk	1	West Springfield	2
Georgetown	1	NORTH ADAMS	1	Westwood	1
Grafton, Vt.	1	NORTHAMPTON	5	Weymouth	1
Great Barrington	2	Northbridge	1	Wilmington	1
Greenfield	5	Norton	2	Winchester	1
Groveland	1	PHILADELPHIA, PA.	1	WORCESTER	4
Guilford, Vt.	1	PITTSFIELD	1		

B. Home Addresses (classified by States and Countries).

	Number.	Per Cent.		Number.	Per Cent.
Connecticut	1	.54	New York	1	.54
Indiana	1	.54	Pennsylvania	1	.54
Maine	1	.54	Switzerland	1	.54
Massachusetts	170	92.39	Vermont	3	1.63
Michigan	1	.54			
New Hampshire	2	1.09		184	99.98
New Jersey	2	1.09			

C. Home Addresses (classified by Counties of Massachusetts).

	Number.	Per Cent.		Number.	Per Cent.
Barnstable	1	.59	Middlesex	35	20.59
Berkshire	7	4.12	Norfolk	13	7.65
Bristol	8	4.71	Plymouth	10	5.88
Essex	12	7.06	Suffolk	7	4.12
Franklin	14	8.23	Worcester	17	10.00
Hampden	32	18.82			
Hampshire	14	8.23		170	100.00

D. Nativity of Parents.

	Number.	Per Cent.
Neither parent foreign born	130	70.65
Both parents foreign born	34	18.48
Father (only) foreign born	14	7.61
Mother (only) foreign born	6	3.26
	184	100.00

E. Education of Father.

	Number.	Per Cent.
Common School	70	38.04
High School	56	30.44
Business School	16	8.69
College or University	34	18.48
No statistics	8	4.35
	184	100.00

F. Occupation of Father.

Agriculture and Horticulture	40	21.74
Artisans	36	19.56
Business	55	29.89
Deceased or no statistics	14	7.61
Miscellaneous	25	13.59
Professional	14	7.61
	184	100.00

G. Intended Vocation of Student.

Agriculture or Horticulture (practical)	35	19.02
Agriculture or Horticulture (professional)	72	39.13
Professions	12	6.52
Miscellaneous	31	16.85
Undecided or no statistics	28	15.22
Home economics	6	3.26
	184	100.00

H. Farm Experience.

Brought up on a farm	54	29.35
Not brought up on a farm and having no or practically no farm experience	67	36.41
Not brought up on a farm, but having had some farm experience	63	34.24
	184	100.00

I. Miscellaneous Statistics.

Average Age (Years)	18.65
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REPORT OF THE TREASURER.**For the Fiscal Year ending Nov. 29, 1924.**

BALANCE SHEET.

	DR.	CR.
1923		
Dec. 1. To balance on hand	\$37,396 08	
1924		
Nov. 29. To departmental income	163,214 32	
Nov. 29. To receipts from State Treasurer	789,590 55	
Nov. 29. To refunds to State Treasurer	1,238 57	
Nov. 29. To bills paid by State Treasurer	92,576 80	
Nov. 29. To receipts from U. S. Treasurer	121,921 57	
Nov. 29. To November schedule in transit	126,833 66	
Nov. 29. Refunds transferred to State Treasurer		\$1,238 57
Nov. 29. Expenditures for fiscal year		1,130,933 44
Nov. 29. Income transferred to State Treasurer		163,214 32
Nov. 29. Balance on hand		37,385 22
	\$1,332,771 55	\$1,332,771 55

STATEMENT OF LEGISLATIVE APPORTIONMENT AND EXPENDITURES FOR FISCAL
YEAR ENDING NOV. 29, 1924, AND APPORTIONMENT REQUESTED FOR 1925.

	Apportionment for Last Fiscal Year.	Expenditures.	Requested Apportionment for New Fiscal Year.
College:			
Personal services . . .	\$359,120 26	\$357,151 22	\$371,546 00
Maintenance . . .	209,592 08	191,118 83	211,000 00
	\$568,712 34	\$548,270 05	\$582,646 00
Experiment Station:			
Personal services . . .	\$75,141 58	\$74,699 03	\$82,650 00
Maintenance . . .	19,709 96	19,364 20	22,350 00
	94,851 54	94,063 23	105,000 00
Extension Service:			
Personal services . . .	\$48,579 59	\$48,711 99	\$55,975 00
Maintenance . . .	33,563 23	34,265 80	35,750 00
	82,142 82	82,977 79	91,725 00
Short Courses:			
Personal services . . .	\$58,500 00	\$58,008 24	\$62,738 00
Maintenance . . .	12,512 75	11,958 60	11,400 00
	71,012 75	60,966 84	74,138 00
Market Garden Field Station:			
Personal services . . .	\$6,000 00	\$5,427 42	\$7,000 00
Maintenance . . .	4,315 35	4,813 09	5,000 00
	10,315 35	10,240 51	12,000 00
Trustees travel . . .	\$1,215 95	\$1,193 03	\$1,200 00
Printing reports . . .	2,782 09	2,257 61	2,000 00
Commercial feedstuffs . . .	9,018 20	9,095 30	9,000 00
Totals . . .	13,016 24	12,545 94	12,200 00
Fertilizer law . . .	\$13,513 20	\$13,387 60	\$14,000 00
Poultry law . . .	8,054 34	8,074 20	8,500 00
Milk testing law . . .	600 00	510 01	600 00
Totals . . .	22,167 54	21,971 81	23,100 00
Replacements . . .	\$21,014 25	\$22,368 52	\$25,000 00
Emergency . . .			10,000 00
	\$883,232 83	\$862,404 69	\$935,809 00
Totals . . .		20,828 14	
Balance unexpended . . .		\$883,232 83	

CASH STATEMENT.

	Other Funds.	State Funds.	Totals.
Balance December 1, 1923 . . .	\$37,396 08	-	\$37,396 08

Receipts.

College receipts from students and others			26,606 71
Tuition	-	\$5,995 44	
Laboratory fees	-	6,398 91	
Rent	-	14,212 36	
Departmental Sales			74,695 59
Products	-	68,250 42	
Miscellaneous	-	6,445 17	
Experiment Station			15,580 69
Cranberry receipts	-	6,341 67	
Chemical receipts	-	546 98	
Miscellaneous	-	8,692 04	
Extension Service			908 21
Correspondence	-	625 85	
Miscellaneous	-	282 36	
Short Courses			4,526 16
Students' fees	-	4,118 16	
Winter School	-	408 00	
Miscellaneous	-	-	
Market Garden Field Station			557 38
Produce	-	557 38	
Feed Law	-	18,002 00	18,002 00
Fertilizer Law	-	15,789 50	15,789 50
Milk Testing Law	-	840 87	840 87

	Other Funds.	State Funds.	Totals.
Poultry Disease Law	—	\$5,707 21	\$5,707 21
Treasurer of the Commonwealth			789,590 55
Maintenance	—	706,742 04	
Special Appropriations	—	77,747 69	
Endowment	\$3,313 32		
Department of Education	1,787 50		
Federal Government			121,921 57
Land Grant of 1862	7,300 00		
Hatch Fund of 1887	15,000 00		
Morrill Fund of 1890	16,666 67		
Adams Fund of 1906	15,000 00		
Nelson Fund of 1907	16,666 66		
Smith Lever Fund of 1914	31,234 74		
Short Courses, Federal Project	20,053 50		
November schedules in transit	—	126,833 66	126,833 66
Bills paid by State Treasurer	—	92,576 80	92,576 80
	\$164,418 47	\$1,167,114 51	\$1,331,532 98

Payments.

College expenses			\$594,166 70
Personal services	\$45,896 65	\$357,151 22	
Maintenance	—	191,118 83	
Experiment Station			124,988 23
Personal services	30,925 00	74,699 03	
Maintenance	—	19,364 20	
Extension Service			113,214 78
Personal services	29,865 52	48,711 99	
Maintenance	371 47	34,265 80	
Short Courses			89,941 45
Personal services	10,494 18	58,008 24	
Maintenance	9,480 43	11,958 60	
Market Garden Field Station			10,240 51
Personal services	—	5,427 42	
Maintenance	—	4,813 09	
Trustees Travel	—	1,193 03	1,193 03
Printing reports	—	2,257 61	2,257 61
Replacements	—	22,368 52	22,368 52
Commercial feedstuffs	—	9,095 30	9,095 30
Fertilizer law	—	13,387 60	13,387 60
Milk Testing Law	—	510 01	510 01
Poultry Disease Law	—	8,074 20	8,074 20
Special appropriations			140,436 21
1923 Chemistry Laboratory	—	109,110 47	
1923 Tenement House	—	5,756 43	
1923 Improvements at Tillson Farm	—	829 45	
1923 Tool shed and Garage	—	975 58	
1923 New Walks	—	260 06	
1923 Road Improvements	—	8 39	
1923 Replacement of live stock	—	2,932 72	
1924 Roads and Walks	—	739 17	
1924 Miscellaneous Improvements	—	5,650 00	
1924 Rural Engineering Building	—	12,178 30	
1924 Market Garden Field Station	—	1,995 64	
Income	—	163,214 32	163,214 32
Refunds to State Treasurer	—	1,059 29	1,059 29
Balance	37,385 22	—	37,385 22
	\$164,418 47	\$1,167,114 51	\$1,331,532 98

CURRENT ACCOUNT, 1924.

Disbursements and Receipts.

ACCOUNTS.	Disbursements from Nov. 30, 1923, to Nov. 29, 1924.	Receipts from Nov. 30, 1923, to Nov. 29, 1924.	Apportionment for year ending Nov. 29, 1924.	Balance to Credit.
Dean's Office	\$762 94	\$0 39	\$814 70	\$51 76
Executive Order	9,243 35	3 70	11,202 15	1,958 80
President's Office	1,705 31	3 76	2,073 07	367 76
Registrar's Office	617 51	—	750 50	132 99
Salaries	37,314 73	—	39,600 00	2,285 27
Treasurer's Office	1,835 22	94 96	2,002 20	166 98
Maintenance, Academic:				
Agricultural Economics	448 82	1 00	550 00	101 18
Agricultural Education	518 41	—	400 30	—118 11
Agronomy	1,206 36	188 50	1,214 00	7 64
Animal Husbandry	575 34	102 50	562 65	—12 69
Beekeeping	390 56	9 45	400 00	9 44
Botany	1,538 66	680 10	1,627 57	88 91
Chemistry	6,043 19	1,957 00	5,707 20	—335 99
Dairying	31,634 11	22,770 04	32,572 73	938 62
Domestic Science	1,831 46	77 25	1,410 56	—420 90
Economics and Sociology	4 74	—	100 75	96 01
Entomology	1,276 78	157 00	1,301 00	24 22
Farm Management	409 31	49 50	509 29	99 98
Floriculture	7,874 63	2,755 87	7,810 21	—64 42
Forestry	352 40	104 50	407 88	55 48
Freshman Agriculture	476 28	—	750 00	273 72
General Agriculture	2,778 14	—	2,644 85	—133 29
Horticultural Manufactures	3,562 34	551 09	3,654 78	92 44
Hospital	4,143 76	1,122 20	3,314 92	—828 84
Landscape Gardening	553 77	597 50	621 03	67 26
Language and Literature	296 60	186 00	308 10	11 50
Mathematics	364 70	39 00	400 00	35 30
Microbiology	2,241 41	308 61	2,400 00	158 59
Military Science	1,734 38	35 40	1,702 45	—31 93
Mount Toby	3,555 42	1,756 80	3,551 20	—4 22
Physical Education	1,457 17	—	1,500 00	42 83
Physics	663 00	189 00	755 50	92 50
Pomology	6,788 30	3,016 77	5,718 18	—1,070 12
Poultry Husbandry	16,613 90	16,150 65	14,540 18	—2,073 72
Rural Engineering	905 46	80 50	905 11	—35
Rural Sociology	179 63	—	200 00	20 37
Vegetable Gardening	6,541 60	2,535 47	6,607 25	65 65
Veterinary Science	2,319 58	92 00	2,307 58	—12 00
Women's Dormitory	3,518 15	—	2,747 90	—770 25
Zoology and Geology	546 95	485 00	600 00	53 05
Maintenance, General:				
Farm	16,333 22	2,050 99	13,594 92	—2,738 30
General Horticulture	8,916 87	122 46	9,055 16	138 29
Graduate School	133 29	—	200 00	66 71
Grounds	9,600 22	—	9,546 53	—53 69
Library	7,649 91	93 35	8,143 10	493 19
Live stock	26,299 26	16,915 71	25,037 91	—1,261 35
General Expense	1,184 63	1,172 71	—	—
Operating and Maintenance	122,171 56	24,845 57	140,492 90	18,321 34
Replacements	22,564 52	—	21,014 25	—1,550 27
Endowment fund	10,613 32	10,613 32	10,613 32	3,650 00
Instruction:				
Salaries	192,016 04	—	196,000 00	3,983 96
United States Treasurer, Morrill Fund	16,666 67	16,666 67	16,666 67	9,722 22
United States Treasurer, Nelson Fund	16,666 66	16,666 66	16,666 66	9,722 21
State Treasurer, Account of schedules	—	570,638 57	—	—
Income to State Treasurer	101,302 30	—	—	—
Less Refunds	\$716,942 84	\$715,887 52	\$633,277 21	\$41,915 73
	1,055 32	—	—	—
Balance beginning fiscal year December 1, 1923	\$715,887 52	\$715,887 52	—	—
Balance on hand November 29, 1924	23,094 43	23,094 43	—	—
	\$738,981 95	\$738,981 95	—	—

COLLEGE ACCOUNTS.

Summary.

	Disburse- ments.	Receipts.
Cash on hand Dec. 1, 1923	—	\$23,094 43
Institution receipts Nov. 29, 1924	—	101,302 30
State Treasurer's receipts Nov. 29, 1924	—	570,638 57
United States Treasurer's receipts Nov. 29, 1924	—	33,333 33
State Treasurer, Department of Education	—	1,787 50
State Treasurer, Endowment fund	—	10,613 32
Total Disbursements	\$616,535 22	—
Receipts turned in to State Treasurer	101,302 30	—
	\$717,837 52	\$740,769 45
Bills receivable Dec. 1, 1923, deducted	—	11,029 42
Bills payable Dec. 1, 1923, deducted	1,961 24	—
	\$715,876 28	\$729,740 03
Bills receivable Nov. 29, 1924	—	6,668 97
Bills payable Nov. 29, 1924	1,929 04	—
Balance	18,603 68	—
	\$736,409 00	\$736,409 00

NET COSTS OF THE DEPARTMENTS.

DEPARTMENT.	Salaries.	Labor.	Maintenance.	Total.	Receipts.	Balance.
Dean's Office	\$4,125 01	\$394 34	\$368 60	\$4,887 95	\$0 39	\$4,887 56
Executive Order	—	459 60	8,783 75	9,243 35	3 70	9,239 65
President's Office	16,798 40	291 35	1,413 96	18,503 71	3 76	18,499 95
Registrar's Office	—	103 66	513 85	617 51	—	617 51
Treasurer's Office	16,391 32	273 43	1,561 79	18,226 54	94 96	18,131 58
Totals	\$37,314 73	\$1,522 38	\$12,641 95	\$51,479 06	\$102 81	\$51,376 25
<i>Instruction and Maintenance.</i>						
Agricultural Economics	\$9,310 00	\$43 21	\$405 61	\$9,758 82	\$1 00	\$9,757 82
Agricultural Education	5,441 25	244 13	274 28	5,959 66	—	5,959 66
Agonomy	7,615 00	695 55	510 81	8,821 36	188 50	8,632 86
Animal Husbandry	3,750 00	67 75	507 59	4,325 34	102 50	4,222 84
Beekeeping	2,205 00	73 06	317 50	2,595 56	9 45	2,586 11
Botany	12,617 79	405 79	1,132 87	14,156 45	680 10	13,476 35
Chemistry	15,867 67	1,450 83	4,592 36	21,910 86	1,957 00	19,953 86
Dairying	7,320 00	6,589 65	25,044 46	38,954 11	22,770 04	16,184 07
Dean's Office	2,952 50	—	—	2,952 50	—	2,952 50
Domestic Science	7,762 50	224 15	1,607 31	9,593 96	77 25	9,516 71
Economics and Sociology	1,532 67	—	4 74	1,537 41	—	1,537 41
Entomology	10,697 00	813 30	463 48	11,973 78	157 00	11,816 78
Farm	—	24,685 74	17,946 74	42,632 48	18,966 70	23,665 78
Farm Management	5,500 00	53 74	355 57	5,909 31	49 50	5,859 81
Floriculture	3,570 00	6,426 09	1,448 54	11,444 63	2,755 87	8,688 76
Forestry	2,620 00	204 57	147 83	2,972 40	104 50	2,867 90
Freshman Agriculture	214 93	215 80	260 48	691 21	—	691 21
General Agriculture	2,915 17	2,127 93	650 21	5,693 31	—	5,693 31
General Expense	—	2,767 43	—1,582 80	1,184 63	1,172 71	11 92
General Horticulture	10,303 84	5,483 38	3,433 49	19,220 71	122 46	19,098 25
Graduate School	—	—	133 29	133 29	—	133 29
Grounds	—	8,715 67	884 55	9,600 22	—	9,600 22
Horticultural Manufactures	5,550 00	1,614 98	1,947 36	9,112 34	551 09	8,561 25

Hospital	—	2,481	29	1,662	47	4,143	76	1,122	20	3,021	56
Landscape Gardening	4,582	32	—	553	77	5,136	09	597	50	4,538	59
Language and Literature	22,630	50	55	241	10	22,927	10	186	00	22,741	10
Library	9,202	58	2,142	5,507	81	16,852	49	93	35	16,759	14
Mathematics	11,250	00	236	127	78	11,614	70	39	00	11,575	70
Microbiology	11,173	10	777	1,463	46	13,414	51	308	61	13,105	90
Military	600	00	306	1,427	87	2,334	38	35	40	2,298	98
Mount Toby	—	—	3,423	131	84	3,555	42	1,756	80	1,798	62
Operating and Maintenance	—	—	33,335	88,836	47	122,171	56	24,845	57	97,325	99
Physical Education	10,530	00	513	944	12	11,987	17	—	—	11,987	17
Physics	6,924	19	233	429	40	7,587	19	189	00	7,398	19
Pomology	6,550	00	5,100	1,687	51	13,338	30	3,016	77	10,321	53
Poultry Husbandry	9,779	44	5,329	11,284	86	26,393	34	16,150	65	10,242	69
Registrar's Office	2,041	09	—	—	—	2,041	09	—	—	2,041	09
Replacements	—	—	—	22,564	52	22,564	52	—	—	22,564	52
Rural Engineering	5,700	00	429	475	57	6,605	46	80	50	6,524	96
Rural Sociology	3,685	00	—	179	63	3,864	63	—	—	3,864	63
Vegetable Gardening	2,150	00	5,113	1,427	94	8,691	60	2,535	47	6,156	13
Veterinary	6,349	15	1,160	1,158	79	8,668	73	92	00	8,576	73
Women's Dormitory	—	—	2,715	802	23	3,518	15	—	—	3,518	15
Zoölogy and Geology	5,070	00	141	405	55	5,616	95	485	00	5,131	95
Totals	\$235,962	69	\$126,399	\$201,798	96	\$564,161	48	\$101,199	49	\$462,961	99
Grand totals	\$273,277	42	\$127,922	\$214,440	91	\$615,640	54	\$101,302	30	\$514,338	24

\$10,613	32	Land Grant and Endowment	College Expenses as per Cash Statement:	Total of this Statement:
33,333	33	Morrill & Nelson	\$594,166	70
192	016	04 Instruction	22,368	52
37,314	73	Administration	\$616,535	22
\$273,277	42			
1,950	00	Dept. of Education	\$617,590	54
\$275,227	42		1,055	32 Refunds
			\$616,535	22

EXPENSE OPERATING AND MAINTENANCE.

	Salaries and Labor.	Fuel and Water.	Repairs.	Equipment.	Miscellaneous.	Totals.
General:						
General Superintendent						
Office	\$2,078 33	-	-	-	-	\$2,078 33
Power Plant:	1,056 15	-	-	-	\$117 25	1,173 40
Heat	13,730 74	\$50,906 16	\$3,458 24	-	324 53	68,419 67
Light	6,510 34	-	207 47	-	89 43	6,807 24
Tools	-	-	-	\$1,387 26	-	1,387 26
Amherst Water Company	-	3,615 32	-	-	40 88	3,615 32
Night watchman	2,408 90	-	-	-	-	2,408 90
Mail service	424 17	-	-	-	-	424 17
Water mains	-	-	145 77	-	-	145 77
Steam mains	-	-	1,122 85	-	-	1,122 85
Electric light circuit	-	-	1,044 08	-	-	1,044 08
Freight and Express	-	-	-	-	2,365 99	2,365 99
Telephone	-	-	-	-	2,193 21	2,193 21
Truck	-	-	-	-	793 68	793 68
Miscellaneous sundry	-	-	35 23	-	185 15	220 38
Sewers and cesspools	-	-	243 31	-	-	243 31
Walks and drives	-	-	137 89	-	-	137 89
Emergency maintenance	-	-	1,566 88	-	-	1,566 88
Expert Service:						
Architect	2,334 02	-	-	-	-	2,334 02
Auditors	250 00	-	-	-	-	250 00
Fire department	-	-	-	-	244 03	244 03
Totals	\$28,792 65	\$54,521 48	\$7,961 72	\$1,387 26	\$6,354 15	\$99,017 26

EXPENSE OPERATING AND MAINTENANCE — Continued.

COLLEGE BUILDINGS.	Sundry.	Electric Repairs.	Plumbing Repairs.	Heat Repairs.	C. & M. Repairs.	Janitor.	Totals.
Adam Hall	—	\$93 21	\$143 23	\$51 40	\$64 10	—	\$351 94
Apiary	—	3 02	7 66	24 23	50 69	—	85 60
Cashier's House	—	2 35	57	—	243 70	—	246 62
Clark Hall	—	29 57	34 02	12 89	88 31	—	164 79
Cold Storage Laboratory	—	—	1 63	—	—	—	1 63
Dairy Barn and Storage	—	—	32 48	31 37	355 22	—	449 78
Draper Hall	—	30 71	854 91	238 98	1,920 33	—	3,860 40
Drill Hall and Gun Shed	\$241 42	170 76	49 13	6 15	135 43	\$434 00	3,860 40
Durfee Glass House (old)	—	2 84	28	13 62	12 18	—	193 55
Durfee Glass House (new)	—	—	—	14 93	41 16	—	26 08
Farm Bungalow No. 1	—	—	14 34	16 51	10 64	—	56 09
Farm Bungalow No. 2	—	—	—	—	52 18	—	41 49
Farm Bungalow No. 3	—	—	—	—	52 18	—	52 18
Farm House No. 1	—	—	—	—	92 90	—	176 28
Farm Bull Pens and Fence	—	28 03	38 94	16 41	11 75	—	16 78
Fernald Hall	—	—	5 03	—	—	—	501 66
Flint Laboratory	—	13 76	84 33	123 64	279 93	—	570 28
French Hall	—	12 15	60 55	59 57	438 01	—	412 11
Goessmann Laboratory	—	195 58	58 56	50 96	107 01	—	16 05
Grinnell Arena	—	—	8 02	8 03	—	—	49 36
Harlow House	—	—	3 20	6 43	39 73	—	16 06
Horse Barn	—	—	10 53	—	5 53	—	22 25
Head of Division of Horticulture	—	—	4 87	—	17 38	—	462 88
Horticultural Barn	—	27 64	38 34	—	396 90	—	95 71
Horticultural Garage	—	1 40	3 96	2 03	88 32	—	56
Horticultural Tool Shed	—	—	—	—	56	—	7 90
Hospital	10 29	—	60	—	7 30	—	693 59
Jewett House and Barn	19 21	5 25	29 03	25 47	623 55	—	258 54
Mathematical Building	—	67	2 17	—	230 49	—	54 08
Memorial Hall	—	1 34	9 24	10 33	33 17	—	2,627 19
Microbiology Building	413 82	48 23	32 03	23 06	74 48	2,035 57	403 70
North Dormitory	—	8 36	38 61	71 42	285 31	—	1,906 00
Paige Laboratory and Stable	—	118 11	469 66	135 98	166 27	1,015 98	223 50
Physics Laboratory	—	1 55	127 10	34 60	60 25	—	48 65
Piggery	—	—	9 84	29 15	9 66	—	107 47
Poultry departments:	—	1 25	4 43	18 70	83 09	—	162 40
Poultry No. 1	—	3 26	14 41	8 23	136 50	—	65 87
Poultry No. 2	—	—	3 75	—	62 12	—	7 88
Poultry No. 3	—	—	—	—	46 26	—	46 26
Poultry No. 8	—	—	—	—	46 26	—	46 26
Poultry No. 9	—	—	—	—	46 27	—	46 27
Poultry No. 12	—	—	—	—	—	—	—

FARM DISBURSEMENTS.

	Repairs.	Labor.	Equip- ment.	Feed.	Supplies.	Sundry.	Bedding.	Fer- tilizer.	Seeds.	Improve- ments.	Totals.
Dairy Cattle	-	\$6,412 91	\$93 91	\$1,775 19	\$4,884 96	\$1,612 28	-	-	-	-	\$14,779 25
Horses	-	2,077 11	7 73	100 60	1,227 86	174 83	-	-	-	-	3,588 13
Sheep	-	1,343 22	5 84	49 12	281 99	108 25	-	-	-	-	1,788 42
Swine	-	1,395 01	3 33	230 16	414 86	47 83	-	-	-	-	2,151 19
Supplies	-	503 01	-	2,049 31	-	-	\$1,439 95	-	-	-	3,992 27
Teams	-	190 49	117 30	-	-	309 67	-	-	-	-	236 48
Field Crops	-	4,976 28	-	-	7 20	49 39	-	\$660 09	\$417 76	-	6,110 72
Tools and Machinery	\$867 41	478 77	47 20	-	576 59	-	-	-	-	-	1,969 97
Miscellaneous	-	7,689 92	-	-	48 24	106 36	-	-	-	\$171 53	8,016 05
Totals	\$867 41	\$24,685 74	\$275 31	\$4,264 38	\$7,441 70	\$2,408 61	\$1,439 95	\$660 09	\$417 76	\$171 53	\$42,632 48

FARM CREDITS.

	Wool.	Milk.	Stock.	Sundry.	Labor.	Field Crops.	Tools and Machinery.	Improve- ments.	Totals.
Dairy Cattle	-	\$9,093 15	\$5,317 18	\$18 08	-	-	-	-	\$14,428 41
Horses	-	-	156 27	10 00	-	-	-	-	166 27
Sheep	\$245 86	-	809 59	-	-	-	-	-	1,055 45
Swine	-	-	1,230 58	-	-	-	-	-	1,230 58
Supplies	-	-	-	35 00	-	-	-	-	35 00
Teams	-	-	-	-	\$76 58	-	-	-	76 58
Field Crops	-	-	-	-	-	\$688 55	-	-	688 55
Tools and Machinery	-	-	-	-	133 79	-	-	\$1,152 07	1,285 86
Miscellaneous	-	-	-	-	-	-	-	-	-
Totals	\$245 86	\$9,093 15	\$7,513 62	\$63 08	\$210 37	\$688 55	-	\$1,152 07	\$18,966 70

AGRICULTURAL DIVISION.
Disbursements and Receipts.

	Disburse- ments.	Receipts.
Agronomy	\$1,206 36	\$188 50
Animal husbandry	575 34	102 50
Dairying	31,634 11	22,770 04
Farm	42,632 48	18,966 70
Farm management	409 31	49 50
Poultry husbandry	16,613 90	16,150 65
Rural engineering	905 46	80 50
Division totals	\$93,976 96	\$58,308 39

Summary.

	DR.	CR.
By total division receipts		\$58,308 39
By bills receivable		4,673 60
By net apportionment		30,628 40
To total division disbursements	\$93,976 96	
To bills payable	228 53	
Balance		595 10
	\$94,205 49	\$94,205 49

Inventory of Quick Assets.

	Nov. 30, 1923.	Nov. 29, 1924.
Inventory of produce	\$16,370 55	\$15,607 77
Inventory of cattle	22,855 00	27,635 00
Inventory of swine	1,481 00	1,395 00
Inventory of horses	3,775 00	5,775 00
Inventory of poultry	4,783 50	3,993 50
Inventory of sheep	2,020 00	2,210 00
	\$51,284 55	\$56,616 27

HORTICULTURAL DIVISION.
Disbursements and Receipts.

	Disburse- ments.	Receipts.
Floriculture	\$7,874 63	\$2,755 87
Forestry	352 40	104 50
General Horticulture	8,916 87	122 46
Grounds	9,600 22	—
Horticultural Manufactures	3,562 34	551 09
Landscape Gardening	553 77	597 50
Mount Toby	3,555 42	1,756 80
Pomology	6,788 30	3,016 77
Vegetable Gardening	6,541 60	2,535 47
Division totals	\$47,745 55	\$11,440 46

Summary.

	DR.	CR.
By total division receipts		\$11,440 46
By bills receivable		1,810 32
By net apportionment		35,531 76
To total division disbursements	\$47,745 55	
To bills payable	21 68	
By balance	1,015 31	
	\$48,782 54	\$48,782 54

Inventory of Quick Assets.

	Nov. 30, 1923.	Nov. 29, 1924.
Floriculture	\$2,700 00	\$2,275 00
General horticulture (live stock)	1,140 00	1,265 00
Horticultural manufactures	295 00	532 00
Mount Toby	78 40	542 50
Pomology	575 00	1,500 00
Vegetable Gardening	547 00	584 50
	\$5,335 40	\$6,699 00

EXPERIMENT STATION.*Disbursements and Receipts.*

	Disbursements from Dec. 1, 1923, to Nov. 29, 1924.	Receipts from Dec. 1, 1923, to Nov. 29, 1924.	Apportion- ment for Year ending Nov. 29, 1924.	Balance to Credit.
Administration	\$1,318 80	\$5 43	\$1,533 54	\$214 74
Agricultural economics	867 35	—	913 16	45 81
Agronomy	2,042 29	—	2,040 00	—2 29
Botanical	2,894 99	—	2,967 91	72 92
Chemical	3,206 90	546 98	3,554 47	347 57
Cranberry	4,553 99	6,341 67	4,229 70	—324 29
Entomological	808 09	—	861 20	53 11
Farm Management	148 30	—	200 00	51 70
Freight and Express	181 80	—	175 00	—6 80
Library	1,044 25	—	1,020 24	—24 01
Meteorology	452 58	—	500 00	47 42
Microbiology	1,014 75	—	1,020 81	6 06
Pomology	2,869 41	2,407 13	2,978 20	108 79
Poultry	5,682 30	4,576 71	5,610 50	—71 80
Publications	1,729 64	—	1,789 52	59 88
Salaries	83,977 19	—	83,052 21	—924 98
Station Service	11,668 98	1,426 77	11,882 56	213 58
Veterinary	526 62	276 00	522 52	—4 10
Hatch Fund	—	15,000 00	—	—
Adams Fund	—	15,000 00	—	—
State Treasurer, account of schedules	—	94,063 23	—	—
Income remitted to State Treasurer	15,580 69	—	—	—
	\$140,568 92	\$139,643 92	\$124,851 54	—\$136 69
Balance beginning fiscal year December 1, 1923	—	4,275 00	—	—
Balance on hand November 29, 1924	3,350 00	—	—	—
	\$143,918 92	\$143,918 92	—	—

Summary.

	Disburse- ments.	Receipts.
Cash on hand Dec. 1, 1923	—	\$4,275 00
Receipts from State Treasurer	—	94,063 23
Receipts from United States Treasurer	—	30,000 00
Receipts from other sources	—	15,580 69
Total Disbursements	\$124,988 23	—
Receipts turned in to State Treasurer	15,580 69	—
	\$140,568 92	\$143,918 92
Bills receivable Dec. 1, 1923 deducted	—	1,273 14
Bills payable Dec. 1, 1923 deducted	329 96	—
	\$140,238 96	\$142,645 78
Bills receivable Nov. 29, 1924	—	2,498 37
Bills payable Nov. 29, 1924	53 59	—
Balance	4,851 60	—
	\$145,144 15	\$145,144 15

EXTENSION SERVICE.
Disbursements and Receipts.

CLASSIFICATION.	Disbursements.	Receipts.	Apportionment.	Balance.
Administration	\$1,678 53	\$102 55	\$3,006 46	\$1,327 93
Animal husbandry	823 62	—	800 00	—23 62
Clothing efficiency	1,961 26	—	2,003 17	41 91
Co-op. marketing	624 27	—	600 30	—23 97
Correspondence Courses	1,126 83	625 85	3,000 00	1,873 17
County Agents work	1,550 84	—	1,002 00	—548 84
Dairying	129 66	—	100 00	—29 66
Exhibits	822 97	—	700 40	—122 57
Extension Courses at College	3,088 42	—	1,501 06	—1,587 36
Extension schools	928 12	—	250 00	—678 12
Farm Management demonstration	795 39	23 50	1,200 00	404 61
Home economics	1,902 10	31 05	2,002 61	100 51
Home gardening	752 73	—	1,000 00	247 27
Household Management	476 59	90	—	—476 59
Horticultural Manufactures	2,209 19	99 04	1,500 60	—708 59
Injurious Insects	17 08	—	—	—17 08
Junior extension work	6,136 54	—	5,505 10	—631 44
Landscape extension	206 00	—	600 70	394 70
Lectures	343 71	—	100 00	—243 71
Library extension	128 66	—	150 00	21 34
Nutrition	745 13	—	1,400 00	654 87
Plant diseases	30 35	—	—	—30 35
Pomology	1,706 98	—	1,315 80	—391 18
Poultry husbandry	1,453 82	5 20	1,102 35	—351 47
Printing	4,123 89	20 12	3,922 33	—201 56
Personal services	48,711 99	—	48,579 59	—132 40
Rural Engineering	27 88	—	—	—27 88
Soils and Crops	479 21	—	800 35	321 14
State Treasurer, account of schedules	—	82,977 79	—	—
Income to State Treasurer	908 21	—	—	—
	\$83,889 97	\$83,886 00	\$82,142 82	—\$838 94
Less refund	3 97	—	—	—
	\$83,886 00	\$83,886 00	—	—

Summary.

	Disbursements.	Receipts.
Balance Dec. 1, 1923 ¹	—	\$9,086 41
Receipts Nov. 29, 1924	—	908 21
Received from State Treasurer	—	82,977 79
Received from United States Treasurer	—	31,234 74
Disbursements to Nov. 29, 1924 ¹	\$113,214 78	—
Receipts turned in to State Treasurer	908 21	—
	\$114,122 79	\$124,207 15
Bills receivable Dec. 1, 1923 deducted	—	23 32
Bills payable Dec. 1, 1923 deducted	58 84	—
	\$114,063 95	\$124,183 83
Bills receivable Nov. 29, 1924	—	63 22
Bills payable Nov. 29, 1924	5 12	—
Balance	10,177 98	—
	\$124,247 05	\$124,247 05

¹ Includes Federal Smith-Lever Fund.

SMITH-LEVER FUND (FEDERAL).

	Disbursements.	Receipts.
Administration	\$275 22	—
Home economics	18 13	—
Junior extension	35 72	—
Salaries	29,865 52	—
Vegetable gardening	42 40	—
State Treasurer	—	\$31,234 74
	\$30,236 99	\$31,234 74
Balance beginning fiscal year Dec. 1, 1923	—	9,086 41
Balance on hand Nov. 29, 1924	10,084 16	—
Totals	\$40,321 15	\$40,321 15

SHORT COURSES.

	Disbursements.	Receipts.	Apportionment.	Balance.
Agricultural economics	\$32 44	—	\$50 00	\$17 56
Agronomy	503 80	\$221 50	500 00	—3 80
Animal husbandry	67 96	100 50	100 00	32 04
Dairying	2,996 78	268 00	3,000 00	3 22
Domestic science	179 86	—	100 00	—79 86
Entomology	94 87	—	100 00	5 13
Farm Management	37 11	—	50 00	12 89
Floriculture	139 52	72 50	100 00	—39 52
Forestry	—	—	50 00	50 00
Horticulture	271 31	69 50	200 00	—71 31
Horticultural Manufactures	495 42	—	726 24	230 82
Library	136 27	—	125 00	—11 27
Microbiology	37 24	31 16	50 00	12 76
Personal services	58,008 24	—	58,500 00	491 76
Physical education	208 55	—	200 00	—8 55
Pomology	825 23	—	949 90	124 67
Poultry husbandry	702 67	271 50	600 00	—102 67
Rural engineering	740 42	275 50	850 00	109 58
Short Course Office	4,100 58	—	4,168 55	67 97
Treasurer's Office	248 26	—	289 10	40 84
Tuition	—	2,730 00	—	—
Vegetable gardening	140 31	78 00	303 96	163 65
Winter school registration	—	408 00	—	—
State Treasurer, account of schedules	—	69,966 84	—	—
Income to State Treasurer	4,526 16	—	—	—
Totals	\$74,493 00	\$74,493 00	\$71,012 75	\$1,045 91

Summary.

	Disbursements.	Receipts.
State appropriation	—	\$71,012 75
Amount of receipts	—	4,526 16
Receipts transferred to State Treasurer	\$4,526 16	—
Department expenditures	69,966 84	—
Balance unexpended	1,045 91	—
Totals	\$75,538 91	\$75,538 91

MARKET-GARDEN FIELD STATION.

	Debit.	Credit.
Labor	\$5,427 42	
Maintenance	4,813 09	
Totals	\$10,240 51	
State appropriation		\$10,315 35
Amount of Receipts		557 38
Amount of Receipts transferred to State Treasurer	\$557 38	
Department expenditures	10,240 51	
Balance unexpended	74 84	
Totals	\$10,872 73	\$10,872 73

SPECIAL APPROPRIATIONS.

	Date made.	Appropriations.	Amount Expended to Date.	Unexpended Balance.
Chemistry Laboratory	1922	\$300,000 00	\$294,385 78	\$5,614 22
Tenement House	1923	8,000 00	8,000 00	—
Improvements at Tillson Farm	1923	5,000 00	5,000 00	—
Tool shed and Garage	1923	6,000 00	6,000 00	—
New walks	1923	2,500 00	2,500 00	—
Road Improvements	1923	8,000 00	8,000 00	—
Replacement of Live stock	1923	5,000 00	5,000 00	—
Roads and Walks	1924	1,000 00	739 17	260 83
Emergency needs	1924	5,000 00	—	5,000 00
Miscellaneous Improvements	1924	5,650 00	5,650 00	—
Rural Engineering building	1924	15,000 00	12,178 30	2,821 70
Market garden Field station	1924	25,000 00	1,995 64	23,004 36
Amount spent previous to Dec. 1, 1923	—	\$386,150 00	\$349,448 89	\$36,701 11
Amount expended during fiscal year	—	—	—	209,012 68
Unexpended balance Nov. 29, 1924	—	—	36,701 11	140,436 21
	—	\$386,150 00	\$386,150 00	\$386,150 00

INVENTORY — REAL ESTATE.

Land (Estimated Value).

Angus Land	\$800 00
Allen Place	500 00
Baker Place	2,500 00
Bangs Place	2,350 00
Brooks Farm	11,000 00
Brown Land	500 00
Charmbury Place	450 00
Clark Place	4,500 00
College Farm	37,000 00
Cranberry Land	12,745 00
George Cutler Jr. Trustee	2,700 00
Dickinson Land	7,850 00
Harlow Farm and Orchard	3,284 63
Hawley and Brown Place	675 00
Kellogg Place	3,368 45
Loomis Place	415 00
Louisa Baker Place	5,000 00
Market Garden Field Station	21,000 00
Mount Toby demonstration forest	30,000 00
Newell Farm	2,800 00
Old Creamery Place	1,000 00
Owen Farm	5,000 00
Pelham Quarry	500 00
Tillson Farm	2,950 00
Westcott Place	2,250 00
	\$161,138 08

College Buildings (Estimated Value, 1924).

	Inventory at Beginning of Year.	Per Cent deducted.	Value at Beginning of Year less Deterioration.	Repairs and Improvements during Year.	Total Value at Close of Fiscal Year.
Adams Hall	\$125,809 90	2	\$123,293 70	\$498 94	\$123,792 64
Apiary	2,827 13	2	2,770 59	85 60	2,856 19
Cashier's House	2,145 83	5	2,038 54	246 62	2,285 16
Chemistry Store House	49 55	2	48 56	-	48 56
Clark Hall	60,205 69	2	59,001 58	164 79	59,166 37
Cold Storage Laboratory	10,172 62	2	9,969 17	1 63	9,970 80
Dairy Barn and Storage	29,361 49	3	28,480 65	449 78	28,930 43
Draper Hall	71,971 67	3	69,812 52	3,618 98	73,431 50
Drill Hall and Gun Shed	9,223 52	5	8,762 34	193 55	8,955 89
Durfee Glass House, old	7,296 29	5	6,931 48	26 08	6,957 56
Durfee Glass House, new	10,247 16	5	9,734 80	56 09	9,790 89
Farm Blacksmith Shop	418 13	3	405 59	-	405 59
Farm Bungalow No. 1	2,477 64	3	2,403 31	41 49	2,444 80
Farm Bungalow No. 2	-	-	-	-	4,265 16
Farm Bungalow No. 3	-	-	-	-	4,207 93
Farm House No. 1	3,196 62	3	3,100 62	176 28	3,276 90
Farm Bull Pens and Fence	4,529 40	5	4,302 93	67 78	4,370 71
Fernald Hall	69,982 09	2	68,582 45	550 06	69,132 51
Flint Laboratory	69,580 58	2	68,188 97	2,856 82	71,045 79
French Hall	45,696 77	2	44,782 83	776 83	45,559 66
Goessmann Laboratory	-	-	-	-	288,299 00
Grinnell Arena	8,628 35	2	8,455 78	90 90	8,546 68
Ground Tool Shed	189 57	5	180 09	-	180 09
Harlow House	2,090 29	5	1,985 78	16 06	2,001 84
Horse Barn	4,627 08	3	4,488 27	22 25	4,510 52
Head of Division of Horticulture	2,761 34	5	2,623 27	462 88	3,086 15
Horticultural Barn	3,761 82	3	3,648 97	95 71	3,744 68
Horticultural Garage	1,533 48	3	1,487 48	56	1,488 04
Horticultural Tool Shed	4,294 06	3	4,165 24	983 48	5,148 72
Horticultural Open Shed	445 88	5	423 59	-	423 59
Horticultural Manufactures Shed	3,271 38	5	3,107 81	-	3,107 81
Hospital	15,426 88	2	15,118 34	683 30	15,801 64
Jewett House and Barn	3,156 03	5	2,998 23	239 33	3,237 56
Machinery Barn	3,342 20	3	3,241 93	-	3,241 93
Market Garden Field Station Farmhouse	-	-	-	-	6,000 00
Market Garden Field Station Ice House	-	-	-	-	100 00
Market Garden Field Station Large Cow Barn	-	-	-	-	9,000 00
Market Garden Field Station Small Stock Barn	-	-	-	-	2,000 00
Market Garden Field Station Small Shed	-	-	-	-	800 00
Mathematical Building	4,394 90	5	4,175 15	54 08	4,229 23
Memorial Hall	102,133 02	2	100,090 36	177 80	100,268 16
Microbiology Building	55,477 59	2	54,368 04	403 70	54,771 74
Military Storage	193 44	5	183 77	-	183 77
Mount Toby House and Barn	3,402 63	5	3,232 50	-	3,232 50
North Dormitory	27,553 35	2	27,002 28	890 02	27,892 30
Paige Laboratory and Stable	23,563 33	2	23,092 06	296 39	23,388 45
Physics Laboratory	4,634 80	5	4,403 06	48 65	4,451 71
Piggery	2,335 97	3	2,265 89	451 94	2,717 83
Poultry departments:					
No. 1, Demonstration Building	1,873 29	2	1,835 82	167 92	2,003 74
2, Oil House	72 09	2	70 65	65 87	136 52
3, Brooder, killing and fattening laboratory	2,268 80	2	2,223 42	7 88	2,231 30
4, Mechanics, storage building and incubator cellar	4,149 59	2	4,066 60	-	4,066 60
5, Laying House	1,750 28	2	1,715 27	-	1,715 27
6, Manure Shed	138 16	2	135 40	-	135 40
7, Small Henhouse	43 09	2	42 13	-	42 13
8, Breeding House	1,416 38	2	1,388 05	46 26	1,434 31
9, Experimental Breeding House	584 99	2	573 29	46 26	619 55
10, Duck House	89 28	2	87 49	-	87 49
11, Unit house for 200 hens	448 21	2	439 25	-	439 25
12, Unit house for 100 hens	361 66	2	354 43	46 27	400 70
Power Plant and Storage Building, including Coal Pocket	49,472 39	2	48,482 94	419 08	48,902 02

College Buildings, Etc. — Concluded.

	Inventory at Beginning of Year.	Per Cent deducted.	Value at Beginning of Year less Deterioration.	Repairs and Improvements during Year.	Total Value at Close of Fiscal Year.
President's House	\$13,589 32	3	\$13,181 64	\$377 51	\$13,559 15
Rural Engineering Building	15,043 63	2	14,742 76	18 16	14,760 92
Sheep Barn	1,308 78	3	1,269 52	254 16	1,523 68
South Dormitory	40,951 76	2	40,132 72	1,434 44	41,567 16
Stable for Cavalry Unit	17,756 81	3	17,424 11	922 12	18,346 23
Stockbridge Hall	162,115 79	2	158,873 47	753 49	159,626 96
Agronomy Greenhouse and storage	1,924 67	2	1,886 18	2,816 06	4,702 24
Stockbridge House	2,240 05	5	2,128 05	24 24	2,152 29
Stone Chapel	29,620 71	2	29,028 30	258 82	29,287 12
Turbine House	17,706 08	2	17,351 96	-	17,351 96
Vegetable Plant House	5,253 33	5	4,990 66	270 50	5,261 26
Waiting Station	503 11	2	493 05	46 40	539 45
Wilder Hall	32,511 68	2	31,861 45	157 35	32,018 80
Young Stock Barns	6,358 44	3	6,167 69	228 96	6,396 65
Totals	\$1,211,961 84	-	\$1,184,294 82	\$23,090 22	\$1,522,057 13

College Equipment (Estimated Value).

Administrative Division:

Dean's Office	\$1,318 45
President's Office	2,676 00
Registrar's Office	1,205 60
Treasurer's Office	5,095 00

Agricultural Division:

Agronomy	8,351 97
Animal Husbandry	925 37
Dairy	25,972 10
Farm	22,968 99
Farm Live Stock	37,015 00
Farm Management	1,150 95
Freshman Agriculture	164 80
General Agriculture	2,248 77
Poultry	9,743 48
Rural Engineering	7,167 93

Rural Home Life

Dining Hall	4,116 79
Extension	29,389 87
General Science:	15,153 93

General Science:

Apiary	2,580 77
Botanical	25,799 76
Chemistry	29,792 63
Entomology	6,314 10
Mathematics	2,329 80
Microbiology	6,577 99
Physics	8,107 12
Veterinary	14,780 62
Zoölogy and Geology	17,348 70

Graduate School

Graduate School	127 18
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Horticultural Division:

Floriculture	13,069 17
Forestry	1,585 83
General Horticulture	8,013 98
Grounds	2,022 06
Horticultural Manufactures	6,029 10
Landscape Gardening	6,208 50
Market Garden Field Station	3,862 22
Mount Toby Reservation	744 36
Pomology	6,519 95
Vegetable Garden	3,679 05

P.D. 31.		43
Hospital		\$1,003 25
Humanities Division:		
Economics and Sociology		189 71
Language and Literature		689 90
Library		139,651 07
Military		1,624 43
Operating and Maintenance:		
College Supply		986 61
Fire Apparatus		1,655 75
General Maintenance:		
Office		785 55
Carpentry and Masonry Supplies		4,593 15
Carpentry and Masonry Tools		4,518 89
Electrical Supplies		3,015 81
Electrical Tools		231 29
Electrical Commencement Supplies		619 75
Heating and Plumbing Supplies		9,956 71
Heating and Plumbing Tools		488 90
Painting Supplies		1,475 63
Painting Tools		223 18
Steam Main		54,349 10
Lighting Lines		11,801 11
Janitor's Supplies		1,067 56
Sewer Line		15,974 52
Water Mains		14,181 74
Power Plant:		
General Equipment		102,603 63
Tools		2,616 53
Supplies		406 46
Fuel		5,784 76
Physical Education		1,763 96
Rural Social Science:		
Agricultural Economics		1,987 54
Agricultural Education		1,586 41
Rural Sociology		267 52
Short Course		2,228 94
Text Books		2,100 22
Social Union Room		780 00
Women's Dormitory		16,201 05
Memorial Hall		15,733 24
Totals		\$763,311 76

Experiment Station Buildings (Estimated Value).

	Inventory at Beginning of Year.	Per Cent.	Cost at Beginning of Year less Per Cent Deterioration.	Repairs and Improve- ments during Year.	Total Value at Close of Year.
Agricultural laboratory	\$14,322 17	2	\$14,035 73	\$84 19	\$14,119 92
Agricultural barn	4,230 41	3	4,103 50	790 38	4,893 88
Agricultural farmhouse	1,658 47	3	1,608 72	279 48	1,888 20
Agricultural glasshouse	327 17	5	310 81	776 28	1,087 09
Brooks House	2,930 99	5	2,784 44	111 31	2,895 75
Brooks barn and sheds	1,425 00	5	1,353 75	—	1,353 75
Brooks tobacco barn	—	—	—	—	3,000 00
Cranberry buildings	2,779 87	5	2,640 88	—	2,640 88
Entomological glasshouses	585 01	5	555 76	—	555 76
Plant and Animal Chemistry labor- atory	27,196 64	2	26,652 71	196 04	26,848 75
Plant and Animal Chemistry Barns .	5,346 28	3	5,185 89	748 77	5,934 66
Plant and Animal Chemistry Dairy .	1,520 47	3	1,474 86	283 12	1,757 98
Six poultry houses	702 81	2	688 75	—	688 75
Tillson house	998 77	5	948 83	—	948 83
Tillson barn	882 11	5	838 00	205 60	1,043 60
Tillson Poultry houses (4) Nos. 2-3- 4-5	2,954 04	2	2,894 96	—	2,894 96
Tillson Incubator cellar No. 1 . . .	720 59	2	706 18	—	706 18
Tillson Summer Sheds (3) No. 6 . .	276 96	5	263 11	177 01	440 12
Tillson Pullet Brooder No. 7 . . .	1,091 26	5	1,036 70	85 22	1,121 92
Tillson Hen Brooder No. 8	1,174 46	5	1,115 74	52 73	1,168 47
Totals	\$71,123 48	—	\$69,199 32	\$3,790 13	\$75,989 45

Experiment Station Equipment.

	Estimated Value.
Apiary	\$144 71
Agricultural Economics Department .	379 83
Agronomy Department	165 41
Botanical Laboratory	8,313 41
Chemical Laboratory	31,835 78
Cranberry Station	6,636 82
Director's Office	4,989 45
Entomological Laboratory	24,603 46
Meteorological Laboratory	741 00
Microbiological Laboratory	3,609 70
Pomology	5,382 18
Poultry Department	5,977 93
Station Service	9,423 05
Treasurer's Office	982 53
Veterinary	2,076 59
Totals	\$105,261 85

Summary.

	Acres.
Land	\$161,138 08
College buildings	1,522,057 13
College equipment	763,311 76
Experiment Station buildings	75,989 45
Experiment Station equipment	105,261 85
Total	\$2,627,758 27
College estate (area)	702.19
Cranberry Station, Wareham (area) .	23.67
Market Garden Field Station, Waltham (area)	55.39
Mount Toby demonstration forest (area)	755.27
Rifle range	46.20
Pelham quarry	.50
Total acreage	1,583.22

STUDENTS' TRUST FUND ACCOUNT.

	Disbursements, Year ending Nov. 29, 1924.	Receipts Year ending Nov. 29, 1924.	Balance on Hand.	Balance brought forward Dec. 1, 1923.
Athletics	\$20,550 17	\$21,830 13	\$878 26	—\$401 70
Dining Hall	103,546 32	96,752 87	—9,911 07	—3,117 62
Keys	54 00	51 00	81 00	84 00
Student deposits	47,764 71	49,133 82	13,887 36	12,518 25
Social Union	2,164 92	2,421 67	340 32	83 57
Text Books	9,554 33	10,669 81	2,438 02	1,322 54
Athletic Field	—	—	169 70	169 70
Uniforms	5,940 72	5,602 19	4,532 51	4,871 04
Cow-Testing	16,572 15	16,427 03	2,069 52	2,214 64
Totals	\$206,147 32	\$202,888 52	\$14,485 62	\$17,744 42
Balance beginning fiscal year	—	17,744 42	—	—
Balance on hand November 29, 1924	14,485 62	—	—	—
Totals	\$220,632 94	\$220,632 94	—	—

CONDENSED OPERATING STATEMENT OF THE DINING HALL.

	Operating Charges.	Income.
1923.		
Dec. 1, Balance	\$3,117 62	—
1924.		
Nov. 29, Total Disbursements	103,546 32	—
Outstanding bills	838 56	—
Total collections	—	\$96,752 87
Accounts outstanding	—	1,669 60
Inventory	—	9,580 29
Balance	500 26	—
Totals	\$108,002 76	\$108,002 76

ENDOWMENT FUND.¹

	Principal.	Income.
United States grant (5 per cent)	\$219,000 00	\$7,300 00
Commonwealth grant (3½ per cent)	142,000 00	3,313 32
	—	\$10,613 32

BURNHAM EMERGENCY FUND.

	Market Value Dec. 1, 1924.	Par Value.	Income.
Two bonds American Telephone and Telegraph Company 4s at \$97	\$1,940 00	\$2,000 00	\$80 00
Two bonds Power Corporation of N. Y. 6½s at \$100	2,000 00	2,000 00	130 00
One United States Liberty Bond 4½s \$101	505 00	500 00	21 25
One bond Ohio Service Company 6s \$103	515 00	500 00	30 00
	\$4,960 00	\$5,000 00	\$261 25
Disbursements for fiscal year ending November 29, 1924	—	—	31 94
	—	—	\$229 31
Unexpended balance December 1, 1923	—	—	93 09
Cash on hand November 29, 1924	—	—	\$322 40

¹ This fund is in the hands of the State Treasurer, and the Massachusetts Agricultural College receives two-thirds of the income from the same.

LIBRARY FUND.

	Market Value Dec. 1, 1924.	Par Value.	Income.
Five bonds New York Central & Hudson River Railroad Com- pany 4s at \$94	\$4,700 00	\$5,000 00	\$200 00
Five bonds Lake Shore and Michigan Southern Railroad Com- pany 4s at \$98	4,900 00	5,000 00	200 00
Two shares New York Central & Hudson River Railroad Com- pany Stock at \$118	236 00	200 00	14 00
Amherst Savings Bank deposit	167 77	167 77	7 59
	<u>\$10,003 77</u>	<u>\$10,367 77</u>	<u>\$421 59</u>
Sales of New York Central & Hudson River (stk) rights	-	-	5 38
	-	-	\$426 97
Disbursements for fiscal year ending Nov. 29, 1924	-	-	426 97

SPECIAL FUNDS.

Endowed Labor Fund (the Gift of a Friend of the College).

Two bonds American Telephone and Telegraph Company 4s at \$97	\$1,940 00	\$2,000 00	\$80 00
Two bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$98	1,960 00	2,000 00	80 00
One bond New York Central R. R. Gold debenture 4s	940 00	1,000 00	40 00
One bond Ohio Service Company 6s	1,030 00	1,000 00	60 00
Amherst Savings Bank, deposit	143 39	143 39	6 49
One bond Indiana Hydro Electric Co. 6s	990 00	1,000 00	-
	<u>\$7,003 39</u>	<u>\$7,143 39</u>	<u>\$266 49</u>
Unexpended balance Dec. 1, 1923	-	-	664 63
United States Liberty Bond	-	-	42 50
Earnings from exchange of bonds	-	-	8 60
	-	-	<u>\$982 22</u>
Cash on hand Nov. 29, 1924	-	-	

Whiting Street Scholarship Fund.

One bond New York Central & Hudson R. R. Gold debenture	\$940 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit	271 64	271 64	12 32
	<u>\$1,211 64</u>	<u>\$1,271 64</u>	<u>\$52 32</u>
Unexpended balance Dec. 1, 1923	-	-	607 97
	-	-	<u>\$660 29</u>
Cash on hand Nov. 29, 1924	-	-	

Hills Fund.

One United States Liberty Bond 4½	\$1,010 00	\$1,000 00	\$42 50
One bond American Telephone and Telegraph Company 4s	970 00	1,000 00	40 00
One bond New York Central & Hudson River Railroad debenture 4s	940 00	1,000 00	40 00
One bond New York Central Railroad debenture 4s	940 00	1,000 00	40 00
Three bonds Pacific Telephone & Telegraph Company 5s at \$99	2,970 00	3,000 00	150 00
One Penn Public Service Corporation 6s	1,010 00	1,000 00	60 00
Boston & Albany Railroad stock 3 5/8 shares at \$160	590 00	362 00	31 68
Amherst Savings Bank, deposit	72 75	72 75	3 28
Electric Securities Company bonds, 1 9/50 bonds at \$98	1,156 40	1,180 00	59 00
Two bonds Great Western Light & Power Co. 6s at \$101	2,020 00	2,000 00	120 00
One bond Potomac Edison Co. at 6½	1,020 00	1,000 00	-
	<u>\$12,689 15</u>	<u>\$12,614 75</u>	<u>\$586 46</u>
Unexpended balance Dec. 1, 1923	-	-	2,339 48
One United States Liberty Bond	-	-	42 50
Earnings from exchange of bonds	-	-	8 44
	-	-	<u>\$2,976 88</u>
Disbursements for fiscal year ending Nov. 29, 1924	-	-	358 00
	-	-	<u>\$2,618 88</u>
Cash on hand Nov. 29, 1924	-	-	

Mary Robinson Fund.

Amherst Savings Bank deposit	\$142 00	\$142 00	\$6 45
Boston & Albany Railroad stock 3/8 share at \$160	60 00	38 00	3 32
Electric Securities Company bonds 41/50 bond at \$98	803 60	820 00	41 00
	<u>\$1,005 60</u>	<u>\$1,000 00</u>	<u>\$50 77</u>
Unexpended balance Dec. 1, 1923	-	-	190 38
	-	-	<u>\$241 15</u>
Cash on hand Nov. 29, 1924	-	-	

Grinnell Prize Fund.

	Market Value Dec. 1, 1924.	Par Value.	Income.
Ten shares New York Central & Hudson River Railroad stock, at \$118	\$1,180 00	\$1,000 00	\$70 00
Unexpended balance Dec. 1, 1923	—	—	255 74
Sales of New York Central & Hudson River rights	—	—	26 90
	\$1,180 00	\$1,000 00	\$352 64
Disbursements for Prizes	—	—	50 00
Cash on hand Nov. 29, 1924	—	—	\$302 64

Gassett Scholarship.

One bond New York Central & Hudson River Railroad debenture ^{4s}	\$940 00	\$1,000 00	\$40 00
Amherst Savings Bank deposit	11 64	11 64	48
	\$951 64	\$1,011 64	\$40 48
Unexpended balance Dec. 1, 1923	—	—	466 26
Cash on hand Nov. 29, 1924	—	—	\$506 74

Massachusetts Agricultural College (Investment).

One share New York Central & Hudson River Railroad stock	\$118 00	\$100 00	\$7 00
Unexpended balance Dec. 1, 1923	—	—	116 45
Sales of New York Central & Hudson River rights	—	—	2 69
Cash on hand Nov. 29, 1924	\$118 00	—	\$126 14

Danforth Keyes Bangs Fund.

Two bonds Pacific Telephone and Telegraph Company 5s at \$99	\$1,980 00	\$2,000 00	\$100 00
Two bonds Union Electric Light and Power Company 5s at \$98	1,960 00	2,000 00	100 00
Two bonds American Telephone and Telegraph Company 4s at \$97	1,940 00	2,000 00	80 00
One bond Oklahoma Gas & Electric Co. 6s	980 00	1,000 00	—
Interest from Student Loans	—	—	118 17
	\$6,860 00	\$7,000 00	\$398 17
Unexpended balance Dec. 1, 1923	—	—	1,372 56
One United States Liberty Bond	—	—	42 50
Earnings from exchange of bonds	—	—	28 61
	—	—	\$1,841 84
Total loans made to students during fiscal year \$2,492	—	—	—
Cash received on account of student loans \$2,869.50	—	—	—
Excess of cash received over loans made	—	—	377 50
Cash on hand Nov. 29, 1924	—	—	\$2,219 34

John C. Cutter Fund.

One bond Pacific Telephone and Telegraph Company 5s	\$990 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1923	—	—	71 83
	\$990 00	\$1,000 00	\$121 83
Disbursements for fiscal year ending Nov. 30, 1924	—	—	30 49
Cash on hand Nov. 29, 1924	—	—	\$91 34

William R. Sessions Fund.

One bond New York Central Railroad debenture 6s	\$565 00	\$500 00	\$30 00
Three United States Liberty Bonds, two at \$1,000 and one at \$500, 4½s at \$101	2,525 00	2,500 00	106 20
One bond Adirondack Light & Power Company 6s	1,010 00	1,000 00	60 00
One bond Southern Illinois Light & Power Company 6s	1,020 00	1,000 00	60 00
	\$5,120 00	\$5,000 00	\$256 25
Unexpended balance Dec. 1, 1923	—	—	69 16
	—	—	\$325 41
Disbursements for fiscal year ending Nov. 29, 1924	—	—	166 57
Cash on hand Nov. 29, 1924	—	—	\$158 84

Alvord Dairy Scholarship Fund.

	Market Value Dec. 1, 1924.	Par Value.	Income.
One United States Liberty Bond 4½	\$1,010 00	\$1,000 00	\$42 50
One bond Southern Illinois Light & Power Co. 7s	1,010 00	1,000 00	70 00
Two bonds Great Western Power Co. 6s at \$101	2,020 00	2,000 00	120 00
Unexpended balance Dec. 1, 1923	\$4,040 00	\$4,000 00	\$232 50
	—	—	1,242 61
Disbursements for fiscal year ending Nov. 29, 1924	—	—	\$1,475 11
	—	—	380 00
Cash on hand Nov. 29, 1924	—	—	\$1,095 11

J. D. W. French Fund.

Two bonds Southern Illinois Light & Power Co. 6s at \$102	\$2,040 00	\$2,000 00	\$120 00
Two bonds Great Western Light & Power Co. 6s at \$101	2,020 00	2,000 00	120 00
Four bonds Penn Public Service Corporation, two 6½s at \$102, two 6s at \$101	4,060 00	4,000 00	250 00
Two bonds Ohio Service Company 6s at \$103	2,060 00	2,000 00	120 00
Unexpended balance Dec. 1, 1923	\$10,180 00	\$10,000 00	\$610 00
	—	—	746 39
Disbursements for fiscal year ending Nov. 29, 1924	—	—	\$1,356 39
	—	—	430 27
Cash on hand Nov. 29, 1924	—	—	\$926 12

Students' Loan Fund of the Massachusetts Agricultural Club.

First National Bank	\$500 00	\$500 00	—
Total loans to students	—	400 00	—
Interest from student loans	—	—	\$100 00
	—	—	3 86
Cash on hand Nov. 29, 1924	—	—	\$103 86

F. H. Crane Fund.

Five bonds Ohio Service Company 6s at \$103	\$5,150 00	\$5,000 00	\$300 00
Two bonds Power Corporation of New York 6½s at \$100	2,000 00	2,000 00	130 00
Four bonds Potomac Edison Company 6½s at \$102	4,080 00	4,000 00	260 00
Four bonds Northern New York Utilities 6s at \$101	4,040 00	4,000 00	240 00
Five bonds Penn Public Service Corporation 6½s at \$102	5,100 00	5,000 00	162 50
Five bonds Illinois Power and Light Corporation 6s at \$101	5,050 00	5,000 00	150 00
Amherst Savings Bank	250 00	250 00	93
Interest on bonds	\$423 70	—	—
Scholarships to students	200 00	—	—
Printing	4 16	—	627 86
Cash on hand Nov. 29, 1924	—	—	\$615 57

SUMMARY OF BALANCE ON HAND OF THE INCOME FROM FUNDS HELD IN TRUST
BY THE M. A. C.

Burnham Emergency Fund	\$322 40
Endowed Labor Fund	982 22
Whiting Street Scholarship Fund	660 29
Hills Fund	2,618 88
Mary Robinson Fund	241 15
Grinnell Prize Fund	302 64
Gassett Scholarship	506 74
Massachusetts Agricultural College Investment	126 14
Danforth Keyes Bangs Fund	2,219 34
John C. Cutter Fund	91 34
Alvord Dairy Scholarship Fund	1,095 11
J. D. W. French Fund	926 12
Massachusetts Agricultural Club Fund	103 86
William R. Sessions Fund	158 84
F. H. Crane Fund	615 57
	\$10,970 64

I hereby certify that I have this day examined the Massachusetts Agricultural College Account, as reported by the Treasurer, Fred C. Kenney, for the year ending November 29, 1924. All bonds and investments are as represented in the Treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

JANUARY 5, 1925.

CHARLES A. GLEASON,
Auditor.

HISTORY OF SPECIAL FUNDS.

Burnham Emergency Fund. — A bequest of \$5,000 from T. O. H. P. Burnham of Boston made without any conditions. The Trustees of the College have used this fund in any cases of emergency where funds were not available. At present the fund is intact and the income only has been used for such emergency matters as the Trustees have authorized. The fund now shows an investment of \$5,000.00.

Library Fund. — The library of the college at the present time contains 73,380 volumes. The income from the fund raised by the alumni and others is devoted to its increase, and additions are made from time to time as the needs of the different departments require. Dec. 27, 1883, William Knowlton gave \$2,000; Jan. 1, 1894, Charles L. Flint gave \$1,000; in 1887, Elizur Smith of Lee, Mass., gave \$1,315. These were the largest bequests and now amount to \$10,000.00.

Endowed Labor Fund. — Gift of a friend of the college in 1901, income of which is to be used for the assistance of needy and deserving students, \$5,000.00.

Whiting Street Scholarship Fund. — Gift of Whiting Street of Northampton, for no special purpose, but to be invested and the income used. This fund is now used exclusively for scholarship, \$1,000.00.

Hills Fund. — Gift of Leonard M. and Henry F. Hills of Amherst, Mass., in 1867, to establish and maintain a botanic garden, \$10,000.00.

Mary Robinson Fund. — Gift of Miss Mary Robinson of Medfield, in 1874, for scholarship, \$1,000.00.

Grinnell Prize Fund. — Gift of Hon. Wm. Claffin, to be known as the Grinnell agricultural prize, to be given to the two members of the graduating class who may pass the best oral and written examination in theory and practice of agriculture, given in honor of George B. Grinnell of New York, \$1,000.00.

Gassett Scholarship Fund. — Gift of Henry Gassett of Boston, the income to be used for scholarship, \$1,000.00.

Massachusetts Agricultural College Investment Fund. — Investment made by vote of trustees in 1893 to purchase one share of New York Central & Hudson River Railroad stock. The income from this fund has been allowed to accumulate, \$100.00.

Danforth Keyes Bangs Fund. — Gift of Louisa A. Baker of Amherst, Mass., April 14, 1909, the income thereof to be used annually in aiding poor, industrious, and deserving students to obtain an education in said college, \$6,000.00.

John C. Cutter Fund. — Gift of Dr. John C. Cutter of Worcester, Mass., an alumnus of the college, who died in August, 1909, to be invested by the trustees, and the income to be annually used for the purchase of books on hygiene, \$1,000.00.

Alvord Dairy Scholarship Fund. — Gift of Henry E. Alvord, who was the first instructor in military tactics, 1869-71, and a professor of agriculture, 1885-87, at this institution. The income of this fund is to be applied to the support of any worthy student of said college, graduate or postgraduate, who may be making a specialty of the study of dairy husbandry (broadly considered) with the intention of becoming an investigator, teacher or special practitioner in connection with the dairy industry, provided that no benefits arising from such fund shall at any time be applied to any person who then uses tobacco in any form, or fermented or spirituous beverages, or is known to have done so within one year next preceding, \$4,000.00.

William R. Sessions Fund. — In accordance with the request of my deceased wife, Clara Markham Sessions, made in her last will, I bequeath to the trustees of the Massachusetts Agricultural College, Amherst, Mass., the sum of \$5,000, it being the amount received by me from the estate of the said Clara Markham

Sessions. The said \$5,000 to be kept by the said trustees a perpetual fund, the income from which shall be for the use of the Massachusetts Agricultural College; and according to the further request of my deceased wife, made in her last will, this is to be known as the William R. Sessions fund, and is to be a memorial of William R. Sessions; and it is my special request that the said trustees shall make record of the fact that this fund came from the estate of my deceased wife Clara Markham Sessions, in accordance with her request made in her last will, \$5,000.00.

J. D. W. French Fund.— Gift of the Bay State Agricultural Society of Boston, Massachusetts. This fund to be known as the J. D. W. French Fund, and the Trustees of the Massachusetts Agricultural College are to use the income of this fund where it will do the greatest good, in the interest of Dairying and its allies, also in Forestry, as scholarships, loans, or prizes; especially, however, to help pay the expenses of the judging teams to the National Dairy Show and to the National Livestock Show, \$10,000.00.

Frederick G. Crane Fund.— Gift of Frederick G. Crane of Dalton, Massachusetts. The income of this fund is to be expended by the Trustees of the Massachusetts Agricultural College in aid of worthy undergraduate students of limited financial resources at the college, preference being given to residents of Berkshire County; such payments are to be known as the Frederick G. Crane Scholarships, \$25,000.00.

Massachusetts Agricultural College Fund.— The Massachusetts Agricultural Club gave \$500 to be used as a scholarship fund to the Massachusetts Agricultural College to help out deserving students there, who intended seriously to go into agriculture, interest on loans not to be charged until after graduation, \$500.00.

Total of special funds, \$85,600.00.

FRED C. KENNEY,
Treasurer.



MASSACHUSETTS
AGRICULTURAL COLLEGE

THE SIX WEEKS' SUMMER SCHOOL

JUNE 29 — AUGUST 7

1925



The Commonwealth of Massachusetts

DEPARTMENT OF EDUCATION

THE M. A. C. BULLETIN

Amherst, Mass.

Volume XVII

MAY, 1925

No. 3

SUMMER SCHOOL

MASSACHUSETTS AGRICULTURAL COLLEGE

JUNE 29 — AUGUST 7

1925

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Ten Suggestions for Teachers Attending '25 Summer School

(From the Journal of the National Education Association)

Consider attending a summer school which offers a complete change of scene and climate. The rural teacher will perhaps enjoy the attractions which a large city offers; the city teacher may prefer the summer course given on the coast or in the mountains.

2. Secure summer session catalogues from a number of institutions as soon as they are issued.

3. Study summer session catalogues to find which university or college offers courses in which you are most interested; what outstanding leaders are conducting courses in your field, and what prerequisites are required for these courses.

4. If the membership in a particular class in which you expect to enroll is limited to a small number, mail your application for enrollment in this class as early as possible before registration.

5. Write early for information concerning living quarters. Don't waste the first week of summer school hunting for a place to live.

6. Select one or two courses that will be of greatest help to you in your particular work next year. Consider taking at least one course that is purely avocational. Register for a play course, learn to swim, or renew your pleasure in tennis, etc.

7. Register for a reasonable amount of work. Change of work is a vacation, but over-work is not.

8. Make contacts with people whom you will enjoy knowing. Receptions, outings and parties are planned especially for summer school students. Show your appreciation by attending and having a good time.

9. If you are working toward a college degree ascertain whether the courses you are going to take meet the requirements which you think they do.

10. Work hard but have a good time; store up life enthusiasms.

SUMMER SCHOOL

APPLICATION FOR ENROLLMENT

Name.....Date.....

Post Office.....Street.....State.....

Present occupation

Previous education.....

Subjects.....

.....

Name and address of person to whom word may be sent in case of illness or accident:

.....

Kindly give us the names and addresses of two persons to whom we may refer for a statement of character.

1.

2.

CERTIFICATE OF CITIZENSHIP

PRESIDENT'S OFFICE.

The Massachusetts Agricultural College charges a tuition fee of \$30 for the Summer Session to students who are not residents of Massachusetts. In order to satisfy the college authorities that an applicant is entitled to free tuition they require a statement, signed by the clerk of the city or town in which the applicant resides, certifying to the fact that the father of the applicant is a legal resident of said city or town. Such a statement may be made on the form below. If this is not presented when the student registers, the Treasurer has no option but to collect tuition on the above basis.

.....

To the President of the Massachusetts Agricultural College.

This is to certify that on the date specified below, the father of.....

.....

is a legal resident of.....

City

State

Signed.....

Town or city clerk

Date.....

(Seal)

Mail this blank with your application blank to

ROLAND H. VERBECK, *Director of Short Courses*

MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST, MASS.



GENERAL ANNOUNCEMENT

Organization. — The eighteenth session of the summer school at the Massachusetts Agricultural College will begin June 29 and continue until August 7 inclusive. With the exception of the preparatory courses intended for students planning to enter college in the fall, only graduate and under-graduate work will be offered.

Admission. — There are no formal examinations for admission to the summer session. Students, both men and women, will be admitted to such courses as the instructors in respective courses find they are qualified to pursue with advantage.

The summer school program is arranged for:

1. School superintendents and teachers connected with high schools, normal schools, colleges and universities who seek advanced instruction either with or without relation to an academic degree.

2. College students who desire to further their regular college work.

3. Teachers who desire to pursue courses that will better prepare them for their work.

4. Graduates of high schools who are planning to enter college in the fall and who have not the required number of entrance units.

5. Any serious student who finds in the summer school bulletin courses suited to his preparation and needs.

Registration. — Classes will begin promptly at 8 A.M. Tuesday, June 30, and will be held as announced in the description of courses until Friday, August 7, inclusive. Classes will be held Saturday, July 11.

Students who are not candidates for a degree at the Massachusetts Agricultural College and who do not intend to become a candidate for such a degree during the coming summer and students previously enrolled as candidates for a degree in the Massachusetts Agricultural College may register by mail prior to June 27 or in person on Monday, June 29.

The hours of registration are from 9 A.M. to 5 P.M. Students arriving in Amherst on these dates and between these hours should report immediately at the office of the Director of Short Courses in South College (telephone 424), where full information may be had as to board, rooms, registration, etc.

Students intending to enroll for the first time this summer for work to be credited toward a degree at the Massachusetts Agricultural College should register in person on or before Monday, June 29. Such students should correspond with the Dean or the Registrar of the College.

Students who do not wish definitely to enroll at this time for a degree may later present the work done for credit toward a degree when the regular conditions of college matriculation and registration for a degree have been met.

Registration of Graduate Students. — Graduate students who are not candidates for an advanced degree in the college are not required to file records of past training but should consult the Director of the Graduate School and secure his permission before registering for any courses. Such students will receive from the Director of the Graduate School upon request a statement of the work completed in the Summer Session. Graduate students who wish credit at the Massachusetts Agricultural College must meet the requirements of the graduate school.

Admission. — Admission to the graduate school will be granted:—

1. To graduates of the Massachusetts Agricultural College.

2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of good standing, but has not, as an undergraduate, taken as much of the subject he selects for his major as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that subject as the instructor in charge may consider necessary. He shall do this without credit toward his advanced degree.

Admission to the graduate school does not necessarily admit to candidacy for an advanced degree, — students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership in the graduate school should be presented to the director of the school. Full statements of the applicant's previous training, of the graduate work desired, and of the amount and kind of work already done by him as an undergraduate should be submitted, together with a statement whether the applicant desires to work for a degree.

Registration is required of all students taking graduate courses, the first registration being permitted only after the student has received an authorization card from the director.

Change of Program. — Regular exercises will begin promptly on June 30. Notice of any proposed addition or cancellation of courses must be reported at once in person at the office of the Director of the Summer Session. Students will be allowed after securing the consent of the Director to make such additions or cancellations up to and including July 3. After July 3 they will be permitted to make no changes whatever. A student attending any course is required to do the full work assigned to the class. Absences from class exercises on account of illness may be excused only when certified by a physician.

Credits. — All courses are measured in terms of credit units. A credit is earned by carrying a course that meets two hours a week throughout a term of six weeks. In accordance with this definition a course which meets five hours a week for a term of six weeks would count as two and one-half credits. For each lecture or recitation hour the student is expected to give two hours out of a class preparation for required reading, study, the working of problems, etc. As a rule two hours of laboratory work are considered the equivalent of one hour of lecture or recitation. The total amount of collegiate credit which may be earned can not exceed $7\frac{1}{2}$ term credits.

Housing for Women Students. — The new women's dormitory will be available for women students. There are thirty double and thirty-eight single rooms. A uniform rate of \$3.00 per week will be charged each student. *Each one will be required to supply her own blankets, sheets, pillow cases, etc.* Convenient arrangements for laundry work may be made in Amherst. *Students taking rooms in the dormitory must conform to dormitory regulations.* Observance of these regulations is one of the conditions under which the rooms are rented and failure to comply with the regulations will mean a surrender of the room and a forfeiture of the amount paid.

All requests for dormitory rooms must be made to the Treasurer of the college. A deposit of \$3 is required in order to secure a reservation in the dormitory. Students will be notified by the Treasurer, upon receipt of the fees, as to the location of the room. In case any change is desired, the request should be made immediately. Deposits will not be refunded after the beginning of the summer session. The deposit is applied to total payment for the room at registration.

Cost of Living. — Good board with comfortable rooms can be secured at moderate prices as follows:

Single room \$2.50–\$4.00 per week; double rooms or suites for two persons \$2.00–\$3.00 per person; board \$7.00 per week and up. A list of rooms available in the village will be furnished to summer school students at the time of registration. Every effort will be made by those in charge to see that every one has comfortable accommodations.

The college maintains a cafeteria on the self-service plan in Draper Hall, on the college grounds. Board may be had at from \$6.00 to \$8.00 per week. Good boarding places can also be secured outside of the college if desired.

The Summer Session offers many advantages. Amherst is a quiet college town located in the beautiful Connecticut Valley. The living conditions are excellent and especially desirable for students who wish to spend a part of the summer in study in restful surroundings. The social life of the Summer School is attractive. A series of informals, Saturday excursions, lectures, entertainments and picnics have been arranged. There are many attractive places, groves, brooks, woods, picnic grounds near Amherst easily accessible. A new dormitory provides comfortable accommodations for women students. For men students rooms near the college may be had.

Classes will be kept small in order that the student may have personal attention from the instructor. The instruction will be given by regular members of the college staff assisted by outside specialists chosen in both instances for their achievements in their special field.

Tuition, Fees and Expenses. — Tuition is free for residents of the Commonwealth of Massachusetts. Non-resident students must pay a tuition fee of thirty dollars for the summer session. An entertainment course fee of \$2.00 is charged.

The total estimated expenditure for attendance at the summer session need not exceed: Board for six weeks, \$42.00; Room rent six weeks, \$18.00; Books, \$5.00; Laundry — incidentals; Lecture and entertainment course ticket, \$2.00.

Assemblies. — A student assembly is held once a week on Monday, from 6:30 to 7:00 P.M. At this assembly the notices of the summer session are given, reports of social and other committees made and other business of interest to the student body is transacted. Attendance is required of students unless excused by the Director of Short Courses. A lecture, entertainment and musical program is held in Bowker Auditorium, Stockbridge Hall, on Monday evening of each week from 7.30 to 9.00.

Informals. — At regular intervals through the session informal social gatherings will be held in the gymnasium. It is the desire of the committee to provide recreational and social life on the campus so long as it does not interfere with the regular collegiate work. Every effort will be made to give those in attendance an enjoyable summer. The college campus and the surrounding country is particularly adapted for recreational life.

Rules and Regulations. — As a guide to those who come to the College for the first time, the following extracts are taken from the regular rules of the College: —

The customary high standard of college men and women in honor, manliness, self-respect, and consideration for the rights of others constitutes the standard of student deportment.

It should be understood that the College, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend but also to name conditions under which students may remain in the institution.

It is the custom of the College that all socials should first have the approval of some recognized College authority.

The College. — The College campus occupies an attractive site three-quarters of a mile north of Amherst center. It is connected with the town and the railway station by electric car service. The College has over 700 acres of land, most of which is in a high state of cultivation, and illustrates most of the leading agricultural industries of Massachusetts. There is a large range of greenhouses of the most modern and approved type; there is a modern dairy barn with dairy cattle; there are good horses, pure-bred swine, sheep and poultry; there are fields of corn, potatoes, clover, and grass in season; orchards of apple, peach, plum, and pear trees; tracts of good forest land, nurseries, and market gardens. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology, and chemistry, dealing in the most thorough manner with these special sciences. The advantages of the plant, equipment, and teaching staff are made available to Summer School students.

The Library. — The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 73,000 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the College. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences connected especially with agriculture predominate, but literature, his-

tory, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers are regularly taken and both the current numbers and the back files are readily accessible.

The Library is believed to rank with the best of its kind.

The Library is open for readers from 8 A.M. to 10 P.M. during term time and during part of Sunday. Vacations hours are somewhat shorter.

Short Course Students will find in the Library helpful material of many sorts in connection with their work, and are cordially invited to make use of this material. The librarian and library assistants are always on hand, ready and anxious to help.

COLLEGIATE COURSES

Education. — Special Methods of Teaching Vocational Agriculture, Methods of Teaching Mathematics in High School, Methods of Teaching English in High School, General Psychology, Advanced Educational Psychology, Principles of Secondary Education, Principles and Methods of Teaching, Methods of Teaching Home Economics, Advanced Mental Tests, Supervised Teaching, Tests and Measurements, Content and Method in General Science, Content and Methods in Social Studies in High School, Modern Philosophy of Education, The Employed Teacher of Agriculture, Vocational Education.

Home Economics. — Foods, Elementary Clothing, Advanced Clothing, Millinery, Textiles, Health Education.

Science and Allied Courses. — General Science, Studies in Science, Public Health, Flower Growing, Food Preservation, Dramatics, Design and Practical Arts, Botany, Trees and Shrubs.

FRESHMAN AND PREPARATORY COURSES

Sub-Freshman Courses for College Entrance Credit. — Algebra, English Composition.

Freshman Courses. — English Composition, Mathematics.

COURSES IN EDUCATION AND ALLIED SUBJECTS

The courses indicated here are intended primarily for those who are engaged in teaching or who are preparing to teach. Some of them are of value as general courses for those not having this particular objective. Opportunity is offered for both undergraduate and graduate work. Our experience indicates that these opportunities are appreciated by undergraduate students who are pursuing work toward a degree. Through the co-operation of the State Department of Education the College is able to offer special advantages in training in the field of secondary school teaching and vocational teaching. In this co-operation F. W. Wright, Director of Secondary Education; F. W. Morse, Supervisor of Secondary Education; R. O. Small, Director of Vocational Education; R. W. Stimson, Supervisor of Agricultural Education and possibly others are expected to participate.

51. Principles and Methods of Teaching. — Consists of a study of general principles of teaching and school management applied to particular "cases" taken from actual experience in public school work. Discussions of rational solutions of these "cases" tend to fix the ideas in methods. Certain assigned and optional readings are required. These are both technical and inspirational in character and cover the best there is printed on the subject of methods of teaching. They are supported by sharp class discussions of the main issues. Exercises in teaching under supervision are also required with criticism and discussions of methods and results. 10 class hours. 10 study hours. Credit 5. *Professor Welles.*

55. General Psychology. — This is a basic course for those anticipating further study in psychology as well as a practical and cultural course for those who can take only one course in this field. It deals with the fundamental principles of psychology; the evolution of mind in animals and man; various types and products of social organizations; abnormal psychology including hypnotism, dreams, mental disorders, etc. 10 class hours, 10 study hours. Credit 5. *Professor Jahrling.*

60. Content and Methods in General Science. — In this course consideration is given to the nature, variety, sequence and amount of subject matter in a general science course. Whenever possible the work is built upon the individual problems of those students in the group who are teaching general science. Along with the consideration of content and inseparable from it runs discussion of methods of teaching this subject. Attention is given to the place of general science in the curriculum and its adaptation to local conditions. 10 class hours, 10 study hours. Credit 5. *Miss Davis.*

65. Methods of Teaching English in the High School. — This subject is especially designed for those who teach or supervise English literature and composition. It offers training in the teaching of oral and written composition and the different types of literature. Attention is given to outside reading, the school paper, and other aids to English instruction. Each member of the class will be given opportunity to work out some individual problem which can later be used in actual teaching work. 5 class hours, 5 study hours. Credit 2½.

66. Methods of Teaching and Supervision of Mathematics. — The course will be devoted to the problems of instruction in mathematics in secondary schools. The topics included in the course will be the reorganization of materials of mathematics in the junior and senior high schools. There will also be a thorough study of the modern testing movement in secondary mathematics which will include methods of using and scoring the more important tests in arithmetic, algebra, and mathematical ability. 5 class hours, 5 study hours. Credit 2½. *Mr. Barber.*

68. Content and Methods in Social Studies in High School. — This course considers the place, content and method of teaching social studies in the high school. Some of the items considered are the objectives of education, application of social studies to local environment, suitable text and reference material to cover the ground desired, relation of these studies to ideals of citizenship, etc. 6 class hours, 6 study hours. Credit 3.

75. Principles of Secondary Education. — This is a study of the American High School, both junior and senior. It is designed to acquaint the student with the aims and objectives of the high school and the factors upon which the realization of these aims depend. Some of the specific topics included in the study are administration and supervision, financial support, course of study, qualifications of teachers and recent tendencies and policies in secondary education. 6 class hours, 6 study hours. Credit 3. *Professor Welles, Mr. Frank P. Morse, State Supervisor of Secondary Education, and Mr. R. O. Small, State Director of Vocational Education.*

76. Special Methods in Teaching Vocational Agriculture. — The work consists of outlining lessons and projects for the teaching of agriculture or related subjects in agricultural schools or departments; the application of principles of vocational education as embodied in the Smith-Hughes Act and other legislation relative to agricultural education; the necessary adjustments relating to the school, community and administrative officials. Students electing this course should not elect Course 103. Undergraduates must secure the consent of Professor Welles before enrolling. 10 class hours, 10 study hours. Credit 5. *Professor Welles and Mr. Heald.*

79. Tests and Measurements. — This course is introduced by a brief study of the factors which have been responsible for the development of mental tests. Some attention is given to the general theory upon which mental tests are based. The main content of the course deals with the following: (1) kinds of mental tests (intelligence, educational, vocational), and the purpose of each; (2) a direct study of the content and nature of the different types of tests; (3) administration, and scoring; (4) evaluation of data; (5) application of results, etc. 4 class hours 4 laboratory hours. Credit 3. *Professor Glick.*

80. Supervised Teaching. — This course offers an opportunity for a very limited number of undergraduate students to secure the advantages of a term of apprentice teaching during the summer in schools that carry summer work in agriculture, summer science, project supervision and boys' clubs. Consult Professor Welles, for detailed information. Credits 1-5.

92. Advanced Educational Psychology. — This course deals with the instinctive nature of man with emphasis upon the significance of instincts in the educational process; the laws of learning; the rate and progress of learning; transfer of training; hygiene of mental work; individual differences, their amount, cause and treatment. 6 class hours, 6 study hours. Credit 3. *Professor Glick.*

95. Modern Philosophy of Education. — A study of the culture and ideals of representative nations with emphasis upon the type of education best adapted to their realization. An analysis of the theories underlying national culture and ideals to determine dominant factors of progress and the part played by education in the process. This course has particular reference to the objectives of education in both the broad and narrow sense, involving examination of curricular materials with reference to the realization of these objectives. 6 class hours, 6 study hours. Credit 3. *Professor Jahrling.*

103. The Employed Teacher of Agriculture. — A seminar course primarily for employed teachers and directors of vocational agriculture. Prospective candidates may be admitted by special arrangement. This course deals with problems which grow out of the experiences of Massachusetts teachers of vocational agriculture. It presupposes some acquaintance with the essentials of "General Methods" which, while not required as prerequisite, should at least be taken parallel with if not previous to this course. Constructive assignments bearing upon the individual experiences and prospects of the members of the class are merged with the campaigns under way for better teaching in agricultural schools. "Summer Teaching," "Project work and Project study", "Courses and Plans in Use," "Departmental Relationships" are among the topics developed by the entire group. No student should elect both Special Methods and this course at the same time.

It is desirable that, by previous correspondence, a plan may be developed with reference to individual problems. Suggestions will be offered as to the collection, in advance, of definite data to be used during the course. 10 class hours, 10 study hours. Credit 5. *Mr. Heald.*

104. Vocational Education. — A study of the laws, rulings and policies in Federal and State supported vocational education in the United States. The philosophy and experiences leading to the legislation and the evolution, especially in Massachusetts since 1906, of a well defined body of practice. The types of work involved, the occupations represented, the administration and supervisory problems, standards set, approval factors, machinery necessary and dangers to be avoided. Day schools, part-time and continuation schools, evening schools. Relation to other secondary education. While leaning toward the agricultural field this course avoids the specific phases in courses in methods. 6 class hours, 6 study hours. Credit 3. *Mr. Heald in charge.* Mr. R. O. Small, Director of Vocational Education, and Mr. R. W. Stimson, Supervisor of Agricultural Education, each give one week of service in this course.

COURSES IN HOME ECONOMICS

Home Economics I. Elementary Clothing Problems. — Emphasis on design and color and becomingness to the individual. Practise in making a costume slip, house dress and other dresses in cotton and linen materials. A comparison of home made and ready made garments. A child's dress may take the place of one of these problems. 3 two-hour laboratory periods and 3 lecture periods per week. Credit 3. Class hours. 9. *Mrs. Strahan.*

Home Economics II. Advanced Clothing. — Principles of design and color applied to dresses in wool and silk. Methods of adjusting ready made. Practise in making a flannel dress, a silk afternoon dress, and an evening gown or similar problems. 2 two-hour laboratory periods and 2 lecture periods per week. Credit 2. Class hours 6. *Mrs. Strahan.*

Home Economics III. Textiles. — A study of the development of spinning and weaving. The growth and manufacture of cotton, wool, linen, silk, and artificial silk. Dyeing and printing. Identification of the different textile fibres by means of physical and chemical tests. 2 two-hour laboratory periods and 2 lecture periods per week. Credit 2. Class hours 6. *Miss Gleason.*

Home Economics IV. Millinery. — This course considers different types of hats, their appropriateness and becomingness, with practical work in remodeling of commercial frames and practise in making and trimming several hats. 3 two-hour laboratory periods and 3 lecture periods per week. Credit 3. Class hours 9. *Miss Gleason.*

Home Economics V. Foods. — Principles of cookery with the meal as a working basis. The course gives the fundamental principles of selection and preparation of food. Emphasis is placed on the development of recipes from foundation formulæ and on the consideration of food costs in relation to the home budget. One two-hour laboratory period and one lecture hour daily. Credit 5. Class hours 15. *Miss Lake.*

Home Economics VI. The Nutritional Phases of Health Education. — This course is designed for teachers in the elementary grades who wish to secure background for the nutrition teaching involved in health education. Discussion of general nutritional needs will be followed by special study of the needs of children and how to organize and present the necessary subject matter. Lesson plans and courses of study for the different grades and correlation with other class work will be considered. A demonstration class of children is planned for practical work. 2 two-hour laboratory periods and 3 lectures per week. Credit 2½. Class hours 7. *Miss Hershey.*

Home Economics VII. Methods of Teaching Home Economics. — A study of subject matter content, organization of courses of study, lesson plans. Consideration is given to different types of schools and to the trend of thought relative to education for homemaking. 2 two-hour laboratory periods and 2 lectures per week. Credit 2. Class hours 6.

SCIENCE AND ALLIED COURSES

Food Preservation. — The course in Food Preservation is planned primarily for the teacher of Home Economics but may be applied to the needs of the home manufacturer and the home maker. Special instruction and laboratory exercises will be given each of these groups whenever necessary. The laboratories are available to individual students or to groups of students for special work if desired.

The course is planned to cover in a general way the important methods used in preserving foods; canning, drying, salting, storing and the manufacture of fruit and vegetable products. Students with problems to solve are welcome, and every facility of the Department will be placed at their disposal.

Theories and principles are taught in classroom and through assigned studies. Practical application of these are made in the laboratory. Special emphasis is placed on the scientific principles underlying the various methods employed in preserving foods. The student who thoroughly understands the why of one operation may enlarge this experience by other applications of these principles. Science and experience have added much to our knowledge during the past few years and as a result modern practices in food preservation are not the same as they were a decade ago.

A laboratory note book is required in which the student records all laboratory exercises together with cost accounts of finished products and a criticism of all products made. 5 lecture hours and 5 two-hour laboratory periods a week. Credit 5. Class hours 15. *Professor Chenoweth.*

General Science A. — 1. General Science in curriculum — attention is given to the desirability of General Science in a High School Course and in what year it could be most wisely and fruitfully placed.

2. Methods of Presentation. Class exercises will be given illustrative of the best methods of teaching, a student acting as the teacher and then discussions by all of the success or failure of the method.

3. General Science Course is made and by each student, suiting his or her local conditions. Individual problems are discussed and helpful suggestions contributed by both student and teacher. 5 lecture periods per week. Credit 2½. *Miss Davis.*

General Science B. — In General Science A, subject matter is a means to an end — but in this course individual help is given in the development of a topic, the planning of lessons on that topic, the equipment and illustrative materials necessary for its presentation. This hour is designed wholly for those who haven't a thorough knowledge of the subject matter to be presented. 5 lecture periods per week. Credit 2½. *Miss Davis.*

Studies in Science. — Physical, chemical and vital phenomena will be considered from the standpoint of underlying processes and laws for the purpose of correlating these expressions of nature in the habits, customs, thinking and life of man and society.

Recommended for teachers of science, superintendents and principals of high schools. Five class hours. Credit 2½. *Dr. Marshall.*

Public Health. — This course will treat the following subjects: the human body in health and disease; individual, family and social elements; agencies of disease — nutrition, and food including milk, food poisoning and infection, air and ventilation, water and water supplies, sewage and sewage disposal, avenues of infection, susceptibility and resistance; communicable diseases, isolation and disinfection; public control; health laws and organization.

The course is designed to meet the needs of public school superintendents, principals, and teachers. Five class hours. Credit 2½. *Dr. Marshall.*

Design and Practical Arts. — Lectures and laboratory work developing the value of design, color, and handwork as a rural school asset. Work in binding and its various problems, basketry, elementary weaving, thin and thick cardboard construction, leather work, and rural dyeing; also other phases of rural prevocational subject matter; also rural community craft-work. Those taking this work should bring 9 by 12 inch drawing paper, carbon paper, scissors, ruler, eraser, knife, and pencils. Lecture daily, five two-hour laboratory periods. Credit 5. *Miss Eva Morris.*

Flower Growing. — A. Garden Flowers — This part of the course aims to familiarize the student with the methods of propagation and culture, use and value of the most important plants used in flower gardens, including annuals, biennials, perennials, bedding plants, bulbs, and roses. Soils and fertilizers, as applied to flower gardening, will be considered. The Department of Floriculture has a large garden devoted to the culture of annuals and perennials which provides material for study. B. Indoor Flower Growing — This work is intended for those who wish to grow plants indoors without the use of a greenhouse. It will include a discussion of soils, fertilizers, and containers; methods of propagation and culture of plants suitable for use in the schoolroom or in the home. The filling and care of baskets, window and porch boxes will be considered. Assigned readings. Five lectures and one two-hour laboratory period a week; six weeks. Credit 3. *Professor Thayer.*

Botany for the Teacher. — This course is intended primarily for secondary school teachers of botany, biology, general science, nature study and elementary agriculture, but is open to all. Principles of teaching, methods, model lessons, course content and subject matter are some of the things considered. Collecting and identifying weeds, grasses, trees, shrubs and common "wild flowers" are a feature of the course. 3 two-hour periods a week. 6 Class hours. Credit 1½. *Dr. W. H. Davis.*

Cultivated Trees and Shrubs. — A study of the outstanding features by which these plants may be specifically recognized, their forms and habits of growth and with special emphasis given to leaf characters. So far as possible the class will be brought into direct contact with the living plants about the campus where the student will learn not only the distinguishing features but also the practical use of these plants for ornamentation. 1 lecture per week and 4 2-hr. laboratory periods per week. Credit 2½. *Professor Thompson.*

DRAMATIC PRESENTATION

Professor Patterson's course in Dramatic Presentation has been given to large classes since the beginning of the Summer School. Professor Patterson is a pupil of M. T. Brown, S. S. Perry, George Riddle, and others. He made a special study

of the stage at the Comedie Francaise, Paris, where he was a pupil of Georges Berr. For some years he was on the professional stage with the Boston Museum Company, Maude Banks, Margaret Mather, and Otis Skinner. Mr. Patterson is known as a reader especially of Shakespeare's plays and Rip Van Winkle. He has given courses at West Virginia University, Boston School of Expression, and elsewhere.

The cultural value of dramatics to the individual and to the rural community is very great. It may even inform in methods of agriculture and in standards of rural life. Amateur plays are too conceived as mere shows or social relaxation and are produced in absolute ignorance of stage values, effective stage directions, proper play selection, character casting, and interpretation. Play production can be made both an art and a school for the rural community.

The course is practical. The members of the class are rehearsed in several plays. A few of the best plays will be presented before the school. These presentations have attracted large audiences every year. The needs of teachers who need to produce plays in our schools are specially considered. 2 lectures and 3 two-hour practice periods a week. Credit $2\frac{1}{2}$. *Professor Patterson.*

FRESHMAN AND COLLEGE PREPARATORY COURSES

Freshman English. — English composition for Freshmen. This course is intended to teach straight thinking, sound structure, clear and correct expression. It will consist of lectures, recitations, theme writing and conferences. The amount of credit earned will depend upon the previous preparation of the student, since it is intended for college students who lack Freshman English credit. Five class hours. Credit $2\frac{1}{2}$. *Professor Patterson.*

Preparatory Algebra. — A review class will be offered in algebra covering the four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the n th term and the sum of the terms of arithmetic and geometric progressions, with applications.

The number in this class will be limited to twelve students so that each member of the class will receive individual instruction suited to his particular needs. Each student may advance in the work just as rapidly as his abilities permit. Those who do the work in a satisfactory manner and pass the examinations at the close of the course may present the work either for one or one and one-half entrance units of credit. Only students who already have some knowledge of mathematics should apply for this course. Five class hours, 10 hours required preparation. Credit $1\frac{1}{2}$ units for entrance.

College Entrance English. — This course is intended for students who wish to earn credit in English for college entrance. The course will consist of a thorough review of English grammar, practice in home writing and in the analysis of library selections. Such credit for entrance will be allowed as the previous preparation of the student, his ability and time devoted to this subject warrant. Credit $1\frac{1}{2}$ units for entrance.

Plane Geometry (Review). — The usual theorems and constructions of good textbooks, including the relation of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids. Registration limited to students who have already had considerable knowledge of plane geometry. Credit 1 unit for entrance.

Higher Algebra (Review). — A review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, undetermined

coefficients, summation of series, variation, continued fractions, determinants, permutations and combinations, logarithms, theory of equations. Intended only for students who are able to prove to the satisfaction of the instructor that their previous preparation in algebra is such as will enable them to carry this course in a satisfactory manner. Credit 3. *Professor Machmer.*

SHORT COURSES AT MASSACHUSETTS AGRICULTURAL COLLEGE

THE WINTER SCHOOL

The dates of this school are approximately from January 1 to March 10. The following subjects are offered: general agriculture, including agronomy, types and breeds, live-stock feeding, animal breeding, dairying, animal diseases, poultry husbandry, fruit growing, vegetable gardening, floriculture, horticulture, farm management, botany, entomology, sanitation and hygiene, farm structures, etc.; home-making, including foods, clothing, business of the household, and home care of the sick; professional improvement problems and agricultural education. The Winter School appeals to practical farmers and all who wish short, intensive, yet thorough courses suited to the practical man.

TWO-YEAR COURSE

The Two-Year Course is divided into seven sections, — dairying, animal husbandry, poultry, floriculture, horticulture, pomology, and vegetable gardening.

The first year consists of six months' study at the College and six months of required farm placement training, under the supervision of the College. During the placement period the student is expected to learn much of the practical side of his particular vocation. He is recommended to a position. These positions are on farms, in dairies, greenhouses, poultry plants. The nature of the position depends on the student's particular interest.

The second year consists of nine months' study at the College. On the completion of the course a certificate is granted. Tuition is free to residents of the Commonwealth.

ONE-YEAR VOCATIONAL POULTRY COURSE

This course is limited to 12 students. It begins January 1 of each year. Students are required to do a large amount of practical work at the College plant. It provides excellent training for the man who wishes to go into poultry as a business. In the past it has been one of the most popular of the Short Courses.

MASSACHUSETTS AGRICULTURAL COLLEGE

ANNOUNCEMENT

OF THE

TWO-YEAR COURSE IN PRACTICAL AGRICULTURE

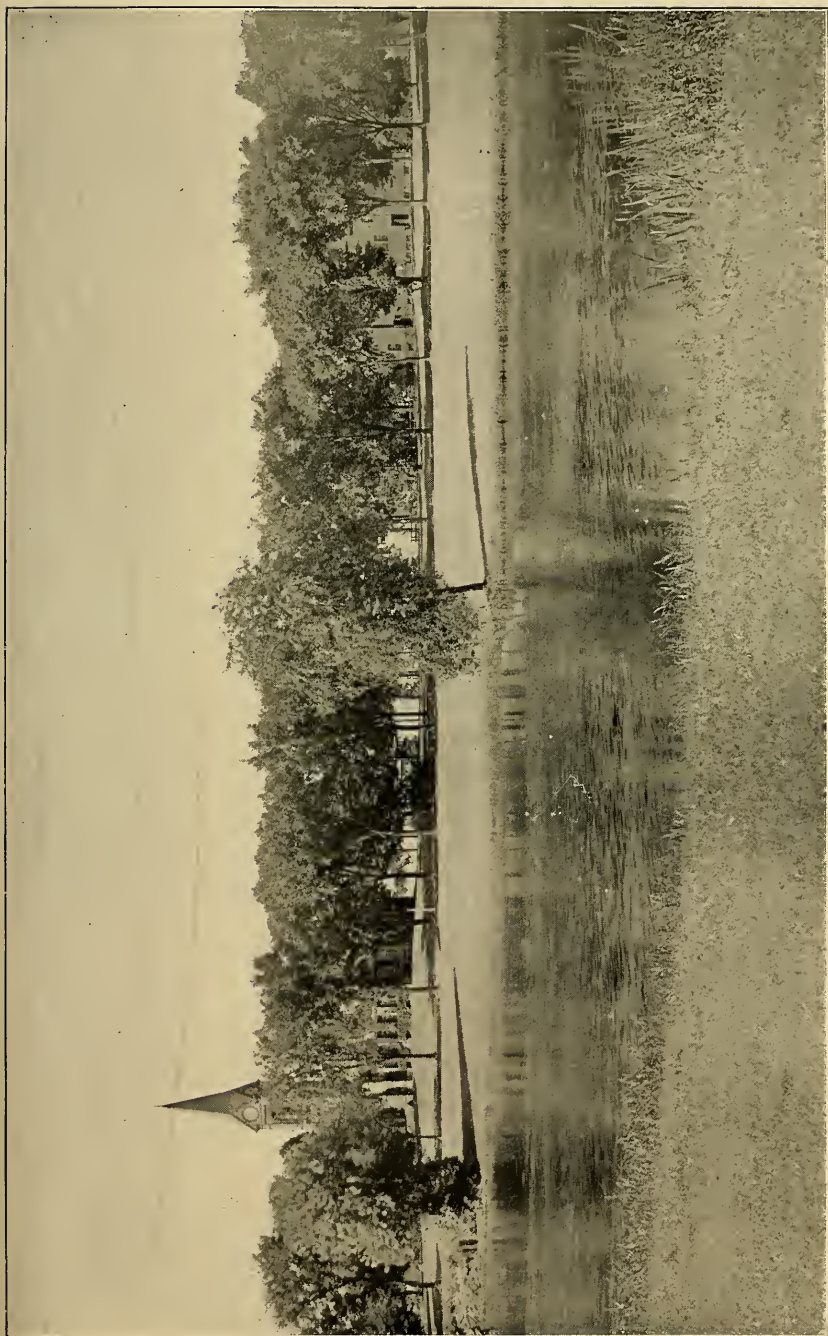
1925 - 1926



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A View of the Campus, showing Library



THE M. A. C. BULLETIN

Amherst, Massachusetts

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CALENDAR, 1925-1926

Two-Year Course

1925

October 5, 6, Monday, Tuesday	Registration
October 7, Wednesday, 8 A.M.	Fall term begins
October 12, Monday	Holiday, Columbus Day
November 25-November 30, Wednesday, 12 m.; Monday, 8 A.M.	Thanksgiving Recess
December 22, Tuesday, 5 P.M.	Fall term ends

1926

January 4, Monday, 8 A.M.	Winter Term begins
February 22, Monday	Holiday, Washington's Birthday
March 20, Saturday 12 m.	Winter term ends
March 29, Monday, 8 A.M.	Spring term begins
April 19, Monday	Holiday, Patriot's Day
May 31, Monday	Holiday, Observance Memorial Day
June 3-7, Thursday-Monday	Commencement
October 4, 5, Monday, Tuesday	Registration
October 6, Wednesday, 8 A.M.	Fall term begins

STAFF

Officers of General College Administration

EDWARD M. LEWIS, A.M.
Acting President of the College

BASIL B. WOOD, A.B.
Librarian of the College
WILLIAM L. MACHMER, A.M.
Acting Registrar of the College
FRED C. KENNEY
Treasurer of the College

EDWARD M. LEWIS, A.M.
Dean of the College
WILLIAM L. MACHMER, A.M.
Assistant Dean of the College
ROLAND H. VERBECK, B.Sc.
Director of Short Courses

RALPH J. WATTS, B.Sc.
Secretary of the College

The Faculty of Instruction

MAX F. ABELL, Ph.D.	North Amherst
<i>Assistant Professor of Farm Management</i>	
LUTHER ARRINGTON, B.Sc.	M. A. C.
<i>Instructor in Horticulture</i>	
LORIN E. BALL, B.Sc.	Allen Street
<i>Instructor in Physical Education</i>	
LUTHER BANTA, B.Sc.	Sunset Avenue
<i>Assistant Professor of Poultry Husbandry</i>	
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<i>Instructor in Home Economics</i>	
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<i>Assistant Professor of Entomology</i>	
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<i>Professor of Horticultural Manufactures and Head of Department</i>	
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<i>Superintendent of Grounds</i>	
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<i>Assistant Professor of Pomology</i>	
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<i>Instructor in Pomology</i>	
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<i>Instructor in Microbiology</i>	
GUY V. GLATFELTER, M.Sc.	10 Kendrick Place
<i>Assistant Professor of Animal Husbandry</i>	

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MARGARET HAMLIN, B.A. <i>Agricultural Counselor of Women</i>	12 North East Street
CURRY S. HICKS, B.Pd. <i>Professor of Physical Education and Hygiene and Head of Department</i>	The Davenport
S. C. HUBBARD <i>Foreman, Department of Floriculture</i>	North Amherst
HENRY F. JUDKINS, B.Sc. <i>Professor of Dairying and Head of Department</i>	103 Butterfield Terrace
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CHARLES A. MICHELS, M.Sc. <i>Assistant Professor of Agronomy</i>	70 Lincoln Avenue
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JOHN B. NEWLON <i>Instructor in Rural Engineering</i>	North Amherst
CHARLES H. PATTERSON, A.M. <i>Professor of English and Coach in Dramatics</i>	26 Lincoln Avenue
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WILLIAM C. SANCTUARY, B.Sc. <i>Professor of Poultry Husbandry</i>	South Amherst
FRED C. SEARS, M.Sc. <i>Professor of Pomology and Head of Department</i>	Mount Pleasant
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HAROLD W. SMART, ATTORNEY <i>Instructor in Business Law and Rural Sociology</i>	Nash Block
GRANT B. SNYDER, B.Sc.Agr. <i>Instructor in Vegetable Gardening</i>	Nash Block
CHARLES H. THAYER <i>Instructor in Agronomy</i>	South East Street
CLARK L. THAYER, B.Sc. <i>Professor of Floriculture and Head of Department</i>	North Amherst
CHARLES H. THOMPSON, M.Sc. <i>Professor of Horticulture</i>	Mount Pleasant
RALPH A. VAN METER, B.Sc. <i>Professor of Pomology</i>	7 East Pleasant Street
PAUL W. VIETS <i>Supervisor of Farm Placement Training</i>	Sunset Avenue
T. GEORGE YAXIS, M.Sc. <i>Assistant Professor of Dairying</i>	Sunset Avenue
<i>Assistant Professor of Rural Engineering</i>	
<i>Instructor in Animal Husbandry</i>	
<i>Instructor in Agricultural Economics</i>	

TWO-YEAR COURSE IN PRACTICAL AGRICULTURE

The Two-Year Course in Practical Agriculture was organized in 1918 to meet the demand for a short course in agriculture that might be taken by students who either did not possess college entrance requirements, or who, for one reason or another, were unable to take the regular Four-Year Course.

Since its organization, at the request of the Massachusetts Legislature, the Two-Year Course in Practical Agriculture has registered over 1,000 students. There are now 401 graduates of the course. Practically all of these are in Massachusetts or in New England, but graduates of the course are to be found in Florida, California, and many other states of the Union.

The growth of the course and the demand for more specific vocational training made necessary a reorganization of the course in 1921. As now arranged the student may specialize in one of seven vocations,—animal husbandry, dairying, floriculture, horticulture, pomology, poultry and vegetable gardening. This

specialization does not prevent his securing a general working knowledge of other subjects.

The Two-Year Course will appeal not only to young men and women, but also to men and women of mature years and practical experience who wish to know more about the business of farming.

FARM PLACEMENT

The work of placing students on farms is in charge of the supervisor of farm placement training. Farms are selected in the State that will enable a student to gain practical experience in his particular vocation. This farm experience may, by special arrangement, be secured on the home farm. As a rule, it will be found better for a student to spend this six months away from the home farm, even though he plans to be employed on the home farm after finishing the course. This statement is based on the experience of students who have already taken the course.

If credit is to be secured for the six months' placement training the following conditions must be carefully observed: (1) the student must interview the supervisor early in his first year in order that his qualifications, the type of farming he wishes to pursue, and his general fitness be determined; (2) no arrangement for placement training may be made by the student himself until the supervisor has been consulted; (3) students are required to complete their period of training without unnecessary absences; (4) no transfers are to be made by a student if he is to receive credit until permission has been had from the supervisor; (5) a position may not be given up by the student until the supervisor has been notified; (6) students will not be permitted to appear with the graduating class until the farm placement has been fully completed; (7) a monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period. It should be clearly understood by both employer and employee that the same energy, regularity and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' farm experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

RULES AND REGULATIONS

Absences from Class

Regularity in attendance at all classes is required of the student body. It is expected that a student will not be absent except for good reasons. In the event of absences the work must be made up to the satisfaction of the instructor. Absences from exercises immediately before or after a holiday may not be taken without special permission. All applications to the Director for excuses of absence shall be made in writing and presented in person. They must, if possible, be made in advance. If they cannot be made in advance they must be made within two days after the expiration of the period of absence, and they must contain a full statement of the reason of the delay in presenting them.

In the record of absences two tardy marks shall be considered equivalent to one absence.

Absences from Examinations or Tests

Any student who absents himself from an appointed examination without sufficient cause shall be given zero thereon. In such case he shall not be entitled to a make-up examination unless the Director so requests. A previously announced test may, at the discretion of the instructor, be regarded as a test or as an examination.

Every absence taken before enrollment (the signing of the registration card by the teacher) in a class will be counted. The Director, however, may grant the special privilege of a visitor's card.

General Information

INSTRUCTION.—The instruction is given by the regular faculty by means of classroom teaching, laboratory exercises and practical work. The work of the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse and stables. It is designed to offer plain, practical, direct information, and to establish the underlying reasons as well as the method employed in the various operations. The advantages of the college staff of specialists and the college plant with all its resources are thus made available to young men and women electing this course.

ENTRANCE CONDITIONS.—Students must be seventeen years of age or over and have completed at least an elementary school course or its equivalent. They must have had six months' practical farm experience before they will be permitted to enroll for the work of the second year. This experience may be gained after the first year of study at the college. Application for registration must be made at least two weeks before the opening of the college year, and references furnished to whom the college may write concerning a student's ability and general character.

The Two-Year Course is not intended for students already enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools who wish to take the course should bring a statement, either from the principal of the high school or from the parent or guardian, requesting enrollment.

CREDIT AND CERTIFICATE.—In order to obtain a certificate a student is expected to have satisfactorily completed all of the work called for in the general course which he has selected. A total of 125 credits is required for graduation, of which twenty-five credits, or one fifth of the total are assigned to practical training. A student failing to meet the requirements in his six months' summer training cannot be enrolled for his second year, since he is not entitled to a certificate of graduation.

A credit is given for one class hour, of either recitation or lecture, per week throughout a term of twelve weeks. Each two-hour laboratory period also counts for one credit. The course calls for twenty credits each term, that is, four subjects meeting five times per week, either in class or laboratory. Upon the satisfactory completion of the course, the student is given a certificate showing the work he has done and the grades he has obtained. A certificate will not be issued to any student whose record shows a deficiency in any subject or in his farm placement training. At the close of each term students receive a formal report showing the standings given in the subjects pursued by them. If a student's work is deficient in 50 per cent he may be asked to withdraw.

If a student's term mark in any subject falls below 60 per cent, or if he drops a course without the consent of the Director, he is thereby failed (F) in that subject. He shall be debarred from taking the final examination in that subject and must repeat it with the following class.

If the average of the term mark and the final examination is below 60 per cent, the student is thereby conditioned (#).

HOW TO ENROLL.—Each student is required to file with the treasurer of the college a statement, signed by the town (or city) clerk of the town (or city) from which he enrolls, stating that the parent or guardian of the student is a resident of that town. A blank for this purpose is inserted at the end of this catalogue. Upon arrival report at the office of the Director of Short Courses, located in South College, where information may be obtained in regard to board and room, schedule of classes, etc.

Student Expenses

TUITION.—Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$60 a term. The tuition charged persons not citizens of the United States is \$60 a term. *Students entering from Massachusetts are required to file with the President a statement, signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts.*

All students entering the college for the first time in this course are charged

Effective in September, 1926, a tuition fee of \$20 per term will be charged students, residents of Massachusetts enrolled in the four-year and two-year courses.

a matriculation fee of \$5, which, in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the certificate.

LABORATORY FEES

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present the fees charged are as follows:—

	Per Term
Agronomy S-1	\$1 50
Agronomy S-2	2 00
Animal Husbandry S-1, S-5	1 50
Animal Husbandry S-4	1 00
Dairying S-1, S-2, S-3, S-4	3 00
Floriculture S-3, S-5	3 00
Floriculture S-6	2 50
Horticulture S-1	1 00
Horticulture S-5, S-6, S-7	1 50
Microbiology S-2	5 00
Poultry S-1, S-2, S-3, S-4, S-5	2 00
Rural Engineering S-1, S-2, S-3, S-4, S-5, S-6, S-7	1 50
Vegetable Gardening S-1, S-2	1 50

INITIAL CHARGES

At the opening of the college year, before students are registered in their classes the following charges are payable at the treasurer's office:—

Matriculation fee	\$5 00	—
Board (at college dining hall) four weeks in advance	28 00	\$28 00
Assessment for support of Social Union	1 50	1 50
Laboratory fees	See schedule	See schedule
Student tax for support of athletics ¹	15 00	15 00
Student tax for support of non-athletic activities ¹	3 50	3 50

¹ While this is not essentially a college charge, the Treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers, the amount of athletic tax by vote of the student body.

The necessary college expenses are estimated as follows:—

Tuition: citizens of Massachusetts, free; others \$180 a year.

	Low	High
Matriculation fee, first year	\$5 00	\$5 00
Room in private houses	72 00	110 00
Board, \$7 per week	252 00	252 00
Laundry, 50 to 85 cents a week	18 00	30 00
Laboratory fees	5 00	20 00
Books, stationery, and miscellaneous items	35 00	70 00
	\$387 00	\$487 00

The estimate given above is for the regular college year of nine months. The estimate for six months would be approximately two-thirds of the amount stated above.

Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is also assumed by students joining clubs or entering into other social activities of the college. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$400 and \$500 per year.

Student Aid

SELF HELP.—Many students are obliged to find work of some sort to earn their way through college. It is recommended that no new student enter without having at least \$250 and preferably \$350 with which to pay his way until he can establish himself in some regular work. The college does not encourage students to enter without money in the expectation of earning their way entirely. The student will find it better either to work and accumulate money before coming to college, or to take more than two years in completing his course, or, instead, to borrow money sufficient to carry him through. No student should undertake

work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

Application for student labor should be made directly to the President of the college. An applicant is required to present statements from parent or guardian and from a public official or other responsible person of the town or city in which he resides, explaining the necessity of the applicant's need of assistance. Students whose department or class work is not satisfactory are not likely to be continued in student labor. Opportunities for labor for Short Course men on the campus are limited to second-year men in the Two-Year Course in Practical Agriculture. Students, therefore, may find it rather difficult to obtain all the work they desire during their first year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

Rooms

Students must secure rooms approved by the college. The assignment of rooms, and the general supervision of the housing of students, is in charge of the Director of Short Courses.

Women students are expected to occupy rooms in the college dormitory and such houses or apartments as the college may provide, and board at the college dining hall. No woman student will be allowed to room in a private house without a special written permission from the Director.

General Exercises

Chapel exercises are held two mornings each week. On Wednesday an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the President is authorized to excuse from Sunday chapel any student who may object to attendance thereon because of his religious scruples, provided his request for excuse therefrom is endorsed by his parent or guardian.

Student Activities

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about fifteen years ago. All students become members of the Union by paying a small fee, and in the fall and winter months the Union gives a series of entertainments, free to students and faculty. The Memorial Building, recently erected, is the center of student activities. Offices for the various student organizations, including the Two-Year Student Council, will be maintained in this building. On the first floor are located a lounging room, the Memorial Room, and the offices; in the basement, bowling alleys, pool tables, store, post office, and barber shop; and on the second floor an auditorium for meetings and dances. This building was erected by the alumni, students, faculty, and friends in honor of the fifty-one "Aggie" men who gave their lives in the World War.

The Young Men's Christian Association is active both socially and religiously. A Catholic club has also been organized.

The Two-Year Council is composed of representatives of the first and second year classes. This body serves as general director of the conduct in classes of the Two-Year men, and represents before the faculty the interests of this group of students.

Student Relations

The customary high standard of college men in honor, manliness, selfrespect, and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the President for discipline.

The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

Infirmary

The college maintains an infirmary for the care of sick or injured students. The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students:—

MANAGEMENT OF THE INFIRMARY

Supervision

1. The infirmary is under the *general supervision* of Dr. Charles E. Marshall, who is designated as Supervisor of the Infirmary. A resident nurse is in *immediate* charge of the infirmary.

Use of Infirmary

2. Students are urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

General Health

3. Students are urged to consult the physical director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident.

General Fee

4. The infirmary fee will be at the rate of \$2 a day, and will be charged when one or more meals are obtained at the infirmary or when the student remains at the infirmary for one or more nights. A nominal charge will be made to outpatients for miscellaneous treatment of a minor character.

Additional Expenses

5. In addition to the fee charged as specified in paragraph 4, the following additional expenses will be charged to the patient:—

(a) *Nurses*.—In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(b) *Professional Service*.—If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(c) *Supplies*.—Special medical supplies prescribed by a physician or nurse will be charged to the patient.

(d) *Laundry*.—Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

The Library

The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 73,000 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the college. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiments Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers, are regularly taken and both the current numbers and the back files are readily accessible.

The Library is believed to rank with the best of its kind.

The Library is open for readers from 8 A.M. to 10 P.M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

Short Course Students will find in the Library helpful material for many sorts in connection with their work, and are cordially invited to make use of this material. The librarian and library assistants are always on hand, ready and anxious to help.

Agricultural Opportunities for Women

Agriculture is a field in which women are finding increasingly good opportunities. Poultry keeping, fruit growing, floriculture, dairying, truck farming, general farming,—all offer favorable openings for women. In all of these branches of agriculture women are farming independently. Women are also filling paid positions which include farm and estate managers and workers, garden supervisors, and workers in boys' and girls' agriculture clubs.

For the woman or girl whose home is already upon the farm the opportunity is exceptionally good. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she can easily carry on and develop a profitable enterprise of her own. The Two-Year Course in Agriculture will afford to the women who wish to engage in farming the practical training which they will need to fit them for their work, and will open to them new doors of opportunity. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences.

Women who are interested in taking agricultural courses should correspond with Miss Margaret Hamlin, who acts as adviser for agricultural courses for women. Women interested in home economics should address Miss Edna L. Skinner.

Positions

The college does not guarantee positions to students registered in any of its courses, but it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and of his farm experience, and of his success in positions for which he has been recommended after he has finished his course. The opportunities for trained men and women, especially those who have had farm experience, are exceptionally good.

A student desiring a recommendation from the college must meet the following conditions:—

- (1) He must be of good character.
- (2) His previous record must be good.
- (3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of farm experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

ANIMAL HUSBANDRY

The course in Animal Husbandry is designed to give men a broad knowledge of the problems surrounding the breeding and production of farm live stock. It includes enough of the other general agricultural courses to give these men a rather broad view of practical agriculture as a vocation. It is designed to prepare men to become practical farmers as farm superintendents, herdsman, shepherds or farm owners.

The Animal Husbandry Department is especially equipped to give good Animal Husbandry instruction having an excellent laboratory in Grinnell Arena. This arena has a seating capacity of 180, and is adapted to the showing of live stock for judging purposes.

The live-stock equipment consists of about 150 head of cattle, including both dairy, beef, and dual purpose animals. Of the dairy breeds, we have representatives of superior merit of the Guernsey, Jersey, Ayrshire and Holstein. Our beef breed is the Hereford, and our dual purpose breed, the Milking Shorthorn. A few steers are fed out each year. All of these animals are used for classroom purposes from the standpoint of practice judging, feeding, breeding, care and management.

Our sheep equipment is made up of very excellent individuals of both the Shropshire and Southdown breeds. These have been shown at the Eastern States Exposition and won many prizes. The students get practical work in the care and management, shearing and other problems of sheep husbandry.

In swine, we keep a herd each of the Berkshire and Chester White breeds. We have been using excellent sires and are developing two high-class herds.

For horses we have two pure-bred Percheron stallions, four pure-bred Percheron mares, as well as growing colts. We also have a number of work teams of different types which are used for classroom purposes.

All of the equipment in the barns is of practical and sensible type, and everything is available for the instruction of students in Animal Husbandry.

Animal Husbandry

FIRST YEAR

Fall Term

Agronomy S-1 (Soils and Fertilizers)
Animal Husbandry S-1 (Types and Breeds)
Dairy S-1 (General Dairy)
Poultry S-1

Winter Term

Animal Husbandry S-2 (Principles of Feeding)
Microbiology S-1 (Hygiene and Sanitation)
Motors S-2
Business Law S-1

Spring Term

Six months' farm placement training

SECOND YEAR

Fall Term

Animal Husbandry S-3 (Feeding Practice)
Rural Sociology S-1 (Social and Economic Problems)
Rural Engineering S-1 (Farm Engineering)
Construction¹

Winter Term

Animal Husbandry S-4 (Herd Book Study and Animal Breeding)
Pomology S-7 (general)
Farm Management S-1 (Farm Management and Accounts)
Agricultural Economics S-1

Spring Term

Animal Husbandry S-5 (Live-stock Management and Stock Judging)
Agronomy S-2 (Crops)
Veterinary Science S-2 (Animal Diseases)
Vegetable Gardening S-6 (general)

Animal Husbandry S-1. (Types and Breeds.) I.

This course is a study of the history of the various breeds of cattle, swine, and horses; their origin and development; their characteristics; and a discussion of the conditions to which each breed seems best adapted. The laboratory work will give the student an opportunity to do practice judging, which will familiarize him with the different types and breeds. Textbook: Plumb, "Types and Breeds of Farm Animals."

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

¹ Construction—Rural Engineering S-7 + S-3.

Animal Husbandry S-2. (Principles of Feeding.) II.

A study of the fundamental principles of animal nutrition; of the composition and quality of feeding materials and their relative importance for the different classes of farm animals. The latter part of this course will be devoted to a study of feeding standards and the calculation of rations. Textbook: Henry and Morrison, "Feeds and Feeding."

5 class hours a week.

Credits, 5.

Animal Husbandry S-3. (Feeding Practice.) I.

This course will consist of a study of the feeding, care, and management of all classes of live stock, giving special attention to economic production. How to feed to get a large flow of milk, how to fatten, and how to grow breeding animals will receive proper attention. Prerequisite: Types and Breeds and Principles of Feeding. Textbook: Henry and Morrison, "Feeds and Feeding."

5 class hours a week.

Credits, 5.

Animal Husbandry S-4. (Animal Breeding and Herd-Book Study.) II.

A study of the principles involved in reproduction and improvement of farm animals; the laws of heredity and variation; the various methods of breeding,—inbreeding, line breeding, outcrossing, grading, and crossbreeding; the importance of selection; and a discussion of the needs and possibilities of improvement. Prerequisite: Types and Breeds and Principles of Feeding. Textbook: Babcock & Clausen's "Genetics in Relation to Agriculture."

4 class hours and 1 2-hour laboratory period a week.

Credits, 5.

Animal Husbandry S-5. (Live Stock Management and Stock Judging.) III.

This course consists of laboratory work in the college barns by individual students, with handling of all classes of live stock. The course will consist of five two-hour laboratory periods, three of which will be devoted to the problems of live-stock management, and two to stock judging.

5 2-hour laboratory periods a week.

Credits, 5.

Animal Husbandry S-6. (General Animal Husbandry.) I.

This course consists of a general study of the subject material of animal husbandry; types and market classes of live stock, breeds of farm animals, principles and practice of feeding, live-stock breeding; and management of herds, flocks and studs. Laboratory work is given in live-stock judging and management. As much detail of this broad subject is given as is consistent with time allotted. Textbook: Plumb, "A Study of Farm Animals."

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

POULTRY HUSBANDRY

Seven courses are offered by this department. One course is a general course designed particularly to equip the student with the fundamental principles underlying successful poultry keeping as related especially to the farm flock. The other five courses are for the student who desires to specialize in poultry culture.

There is a broad field of opportunity for adequately trained men in the commercial handling and sale of poultry and poultry products, specialists in incubation, brooding and rearing, and assistants or managers of commercial poultry farms. Good profits and wages await well-equipped men and women in these and other branches of poultry work.

This department is well equipped to offer practical instruction in poultry husbandry. Our quarters and equipment in Stockbridge Hall provide ample facilities for efficient classroom and laboratory teaching.

Our practical laboratory (college poultry plant) comprises about 1,500 adult birds, divided into some 40 pens of various designs, the flocks ranging in size from 10 to 250 birds; thirty lamp incubators, as well as three mammoth machines; brooding and rearing facilities for 5,000 chicks, including many styles of stove,



A Class in Egg Packing



Two-Year Course Men Testing Soil

kerosene and electric brooders; facilities for practice in pen management, fattening, killing, picking, caponizing, judging, mixing rations; construction of poultry houses and appliances, etc.

In addition to the actual practice work performed, the student has an opportunity to keep under observation practical experiments and demonstrations continually under way for the instruction of students and practical poultry keepers.

Poultry

FIRST YEAR

<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Agronomy S-1 (Soils and Fertilizers)	Poultry S-2	Six months' farm placement training.
Animal Husbandry S-1 (Types and Breeds)	Microbiology S-1 (Hygiene and Sanitation)	
Dairy S-1 (General Dairy)	Motors S-2	
Poultry S-1	Business Law S-1	

SECOND YEAR

<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Poultry S-3	Poultry S-4	Poultry S-5
Poultry S-7 (Poultry Diseases)	Pomology S-7 (general)	Agronomy S-2 (Crops)
Rural Sociology S-1 (Social and Economic Problems)	Farm Management S-1 (Farm Management and Accounts)	Vegetable Gardening S-6 (general)
Construction ¹	Agricultural Economics S-1	Entomology S-1 (Beekeeping)

Courses in Home Economics and Agricultural Opportunities for Women may be had by arrangement

Poultry S-1. (Judging and Marketing.) I.

Types, breeds, varieties,—their origin and development; poultry judging; utility—for eggs, meat, and constitutional vigor; exhibition—for fancy show-room characteristics by score card and comparison; fattening, killing, dry and scald picking, drawing, shaping, packing, and boning; judging of dressed fowl; market classification of poultry, eggs, and feathers; the requirements of various markets and relative merits of different systems of marketing. Practical exercises will also be provided in all of the above subjects. A trip will be taken to one of the leading Connecticut Valley poultry shows. Opportunity will also be presented each member of the class to fit entries for the Market Poultry Show, held each year as part of the activities of the poultry students of the college.

4 class hours and 2 2-hour laboratory periods a week.

Credits, 6.

Poultry S-2. (Incubation and Brooding.) II.

The principles of incubation, natural and artificial; lamp and mammoth incubators; the production, care and selection of hatching eggs. The principles of brooding and rearing; brooding systems and equipment; management of the colony house and rearing of the chicks. Students will carry through a hatch with the lamp incubators, and will have charge of a colony house of chicks under supervision.

2 class hours and the equivalent of 3 2-hour laboratory periods a week. Credits, 5.

Poultry S-3. (Feeding and Housing.) I.

Principles of feeding; the poultry feeds and compounding of rations. Feeding practices for maintenance and production. Artificial illumination as an aid to winter egg production. Students will have charge of feeding and caring for a pen of laying birds. Poultry houses and fixtures; the principles of design; common types and cost of construction.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Poultry S-4. (Poultry Breeding.) II.

The principles of breeding and their application to poultry practice work in record keeping, pedigree hatching, stud and flock mating will be required as season permits.

4 class hours and 1 2-hour laboratory period a week.

Credits, 5.

Poultry S-5. (Poultry Farm Organization.) III.

A study of the organization of the poultry farm as a business. The layout of the poultry plant for efficiency. Study of poultry surveys, records, accounts and advertising. A trip covering two or three days will be made to representative suc-

¹ Construction — Rural Engineering S-7+S-3.

cessful poultry farms. The expense per student is approximately \$15. This is required of each student taking the course for credit.

Practice work with mammoth incubators will be given this term.

4 class hours and the equivalent of 1 2-hour laboratory period per week. Credits, 5.

Poultry S-6. (General Poultry Course.) II.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation, both natural and artificial; the production and packing of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the breeds and varieties, studies of various types and sizes of incubators, brooders, and brooder houses.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

NOTE.—Students who take course 6 must get permission from the Poultry Department to take advanced poultry courses.

Poultry S-7. (Poultry Sanitation and Disease Control.) I

This course aims to acquaint the student with the normal hygienic conditions under which our domestic poultry thrive best. Sufficient anatomy and physiology will be given to enable the student to distinguish between normal and abnormal conditions. The nature of disinfectants and external and internal antiseptics will be stressed and the students made acquainted with the best usages both scientific and practical in conditing a sanitary program for disease prevention and control. A special effort will be made to link the sanitary, hygienic, and disease control problems with the so-called down-to-date practices in feeding, housing and general management.

3 laboratory periods, Microbiology Department.

2 class hours, Department of Poultry Husbandry.

DAIRY MANUFACTURERS

The course in dairy manufactures is designed to fit men for positions with market milk concerns, creameries, ice-cream factories, and specialized dairy farms. It is limited to 12 students.

The dairy work is given in Flint Laboratory, a modern building designed especially for dairy work and equipped with the newest and best types of dairying machinery.

The pasteurizing room contains a milk clarifier, cooler, and two 200-gallon vat pasteurizers. There is an ample and modern sterilizing outfit and a large and very well-equipped refrigerating plant.

The room designed for cheese making contains double-jacketed vats, cheese mixer, and draining racks, presses, etc. The buttermaking room is well equipped with power and hand churns of various types, scales, and other accessories.

In the starter-making room there is a 50-gallon double-jacketed vat, a 100-gallon vat pasteurizer, a 50-gallon starter can, and other smaller ones.

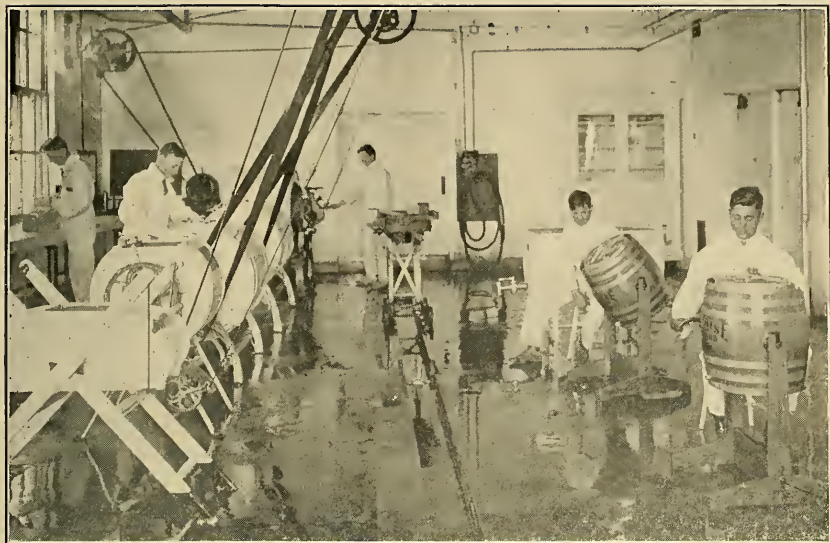
The separator room has a complete equipment of power and hand separators, milk heater, a Babcock tester, sterilizer, etc.

The testing laboratory contains all necessary apparatus, both steam and hand, for Babcock testing, and individual apparatus necessary for each student.

The ice-cream making room contains all such equipment as is found in the modern ice-cream plant.

DAIRY MANUFACTURERS

		FIRST YEAR	
<i>Fall Term</i>		<i>Winter Term</i>	<i>Spring Term</i>
Agromony S-1 (Soils and Fertilizers)	S-1 (Types and Breeds)	Microbiology S-1 (Sanitation and Hygiene)	Six months' farm placement training
Animal Husbandry S-1		Animal Husbandry S-2 (Principles of Feeding)	
Dairy S-1 (General Dairy)		Motors S-2	
Poultry S-1		Business Law S-1	



Making Butter



A Class in Cooking

SECOND YEAR

<i>Fall Term</i>		<i>Winter Term</i>		<i>Spring Term</i>	
Dairy S-2 (10 credits) (Milk Products)		Dairy S-3 (10 credits) (Market Milk)		Dairy S-4 (10 credits) (Butter Making)	
Microbiology S-2 (Dairy Bacteriology)		Farm Management S-1 (Farm Management and Accounts)		Veterinary Science S-2 (Animal Diseases)	
Rural Sociology S-1 (Social and Economic Problems)		Agricultural Economics S-1		Rural Engineering S-5 (Dairy Mechanics)	

Dairy S-1. (General Dairy.) I.

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent of fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, cow test associations, advanced registry work; the handling of market milk; soft cheese making, ice-cream making, and butter making as applied to general farm conditions. The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, and acidity, together with some laboratory work in milk handling, butter making, cheese making, and ice-cream making.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Dairy S-2. (Milk Products.) I.

This course is mainly on soft cheese and ice-cream making, but includes some lectures on the manufacture of other milk products, such as artificial buttermilk, casein, condensed milk, milk powder, etc. It deals primarily with the up-to-date methods of making ice-cream and various kinds of soft cheese, such as pimento, olive, nut, Neufchatel, cottage, etc., and shows how a product of good quality can be made either as a means of marketing the entire milk supply or utilizing the surplus. Considerable attention is given to different methods of preparation for marketing. The laboratory work consists in the making of ice-cream and various forms of soft cheese.

4 class hours and 4 3-hour laboratory periods a week.

Credits, 10.

Dairy S-3. (Market Milk.) II.

This course takes up the history of market milk, its food value and use. Attention is given to the necessary essentials in producing a clean product; the economics of milk production; the advantages of co-operative milk producers' organization; the various methods of marketing milk; clarification; pasteurization; cooling, etc. The laboratory work consists in visiting dairy herds and city milk plants; the operation of machinery used in connection with market milk work.

4 class hours and 4 3-hour laboratory periods a week.

Credits, 10.

Dairy S-4. (Butter Making.) III.

This course covers the various methods of separating milk; the history, selection, care, and use of cream separators; the pasteurization and ripening of cream; testing of acidity in cream; the making and use of starters; a study of churns and churning; up-to-date methods of making butter; marketing butter, and tests for moisture and salt in butter. The laboratory work consists in the actual operation of separators and churns.

4 class hours and 4 3-hour laboratory periods a week.

Credits, 10.

GENERAL HORTICULTURE

The object of this course is to train men for positions as superintendents or foremen on parks or on private estates, or as foremen for landscape gardeners, or for private practice in horticulture service, including so-called tree surgery and city forestry.

Ample classrooms and laboratories with necessary equipment are provided for all work that must necessarily be done indoors. The extensive college campus,

with its stretches of lawn, its plantings of trees, shrubs, and vines, its drives and walks, furnishes an outdoor laboratory where the student will be brought into personal relation with problems comparable in every way with those that arise in the management of a park, private estate, etc. Work with various types of horse power, motor power and hand machinery and implements will give him practical knowledge of their use, care, and application. A growing nursery furnishes opportunity for the propagation and culture of those plants used in ornamenting grounds, the transplanting of these about the grounds in compliance with prepared landscape plans, and their subsequent care, including proper methods of pruning.

Horticulture

FIRST YEAR		
<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Agronomy S-1 (Soils and Fertilizers)	Horticulture S-1 (Plant Propagation)	Six months' farm placement training
Floriculture S-1 (Garden Flowers and Bedding Plants)	Horticulture S-3 (Plant Materials)	
Pomology S-1 (Fruit Varieties)	Construction ¹	
Vegetable Gardening S-1	Business Law S-1	
SECOND YEAR		
<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Horticulture S-2 (Plant Materials)	Forestry S-1 (Woodlot Management)	Horticulture S-4 (Plant Materials)
Horticulture S-5 (Construction and Maintenance)	Horticulture S-6 (Construction and Maintenance)	Horticulture S-7 (Construction and Maintenance)
Floriculture S-6 (Greenhouse Management)	Horticulture S-8	Floriculture S-5 (Conservatory Plants)
Agricultural Economics S-1	Rural Sociology S-1 (Social and Economic Problems)	Motors S-2, or— Entomology S-1 (Beekeeping)

Horticulture S-1. (Plant Propagation.) II.

This course sets forth the principal and best methods used in reproducing and increasing the number of those plants cultivated in the various branches of horticulture.

4 class hours and 1 2-hour laboratory period a week.

Credits, 5.

Horticulture S-2. (The Principles of Plane Surveying with some Simple Applications of the same.) I.

Lectures and laboratory exercises on the construction and use of simple surveying instruments used in the making surveys which are to serve as the basis of plans for parks, cemeteries, or private estates and home grounds.

Credits, 5

Horticulture S-3. (Plant Materials.) II.

The object of this course is to learn to know the trees, shrubs, and vines used in ornamental planting,—their names, their individual characteristics as to foliage, fruit, and dormant twig features, and their habits of growth.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Horticulture S-4. (Plant Materials.) III.

A continuation of Horticulture S-3, giving special attention to foliage and flower characters and flowering habits of the plants. In addition, a study will be made of the evergreens and their uses.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Horticulture S-5. (Construction and Maintenance.) I.

Particular stress will be given to fall pruning of shrubs, together with their preparation for winter, also fall transplanting of shrubs. In addition, instruction will be given in elementary tree surgery and in walk and road maintenance.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Horticulture S-6. (Construction and Maintenance.) II.

In this term cost analyses and various park systems of maintenance will be

¹ Construction—Rural Engineering S-7 + S-3.

discussed, together with park appliances, also winter pruning, snow removal, and winter protection of shrubs.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Horticulture S-7. (Construction and Maintenance.) III.

Especial attention will be given to spring pruning, lawn mowing, and lawn construction and maintenance. Tree surgery, walk and road construction and maintenance, together with weed eradication, will be studied.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Horticulture S-8. (Continuation of Horticulture S-2.) II.

Credits, 5.

POMOLOGY

The courses in fruit growing have been arranged with a view to training the student for work on a farm on which the growing of fruit is the leading branch of farming. As will be seen, he gets a fair training in many other lines of farm work, but the emphasis is on fruit.

It is hoped that students who have completed this work, and who have supplemented it with a sufficient amount of practical experience on the farm, will be fitted to take up fruit farming for themselves, or to manage fruit farms or fruit departments for others.

In all of this fruit work the emphasis is on the practical side, with only enough of the science and theory involved to make the student a more efficient man or woman. If the question under consideration is the healing of wounds made in pruning fruit trees, the student is given a brief discussion of the scientific principles involved, and is then taken into the orchard and required to do pruning in such a way that the wounds made will heal most satisfactorily. If it is a question of how to prune a grapevine to insure the maximum crop, the method of bearing in the grape and the various systems of pruning are discussed in the classroom, and the student is then taken into the vineyard and studies the vine to see where it bore last year, and then prunes it under expert supervision.

The Department of Pomology has 50 acres of orchard of various ages and methods of arrangement, including all the principal fruits; 5 acres of vineyards in which are shown the principal types of trellis and the leading methods of training grapes; several acres of small fruits; and a good equipment of orchard and nursery tools of all the principal types, enabling students to learn the value of each type. For orchard operations, such as spraying and pruning, the most approved makes of pumps, nozzles, pruning saws, knives, etc., are provided.

Pomology

FIRST YEAR

<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Agronomy S-1 (Soils and Fertilizers)	Pomology S-2 (Orchard Production)	Six months' farm placement training
Floriculture S-1 (Garden Flowers and Bedding Plants)	Horticulture S-1 (Plant Propagation)	
Pomology S-1 (Fruit Varieties)	Construction ¹	
Vegetable Gardening S-1	Business Law S-1	

SECOND YEAR

<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Pomology S-3 (Harvesting and Marketing)	Pomology S-4 (Orchard and Vineyard Pruning)	Pomology S-5 (Spraying)
Horticultural Manufactures S-1	Poultry S-6 (general)	Pomology S-6 (Orchard Management)
Agricultural Economics S-1	Rural Sociology S-1 (Social and Economic Problems)	Agronomy S-2 (Crops)
Dairy S-1 (general)	Animal Husbandry S-6 (general)	Motors S-2, or—
		Entomology S-1 (Beekeeping), or—
		Horticultural Manufactures S-2

Pomology S-1. (Fruit Varieties.) I.

This introductory course of the work in fruit growing will consist of a thorough study of the principal varieties of the different fruits.

One of the most prolific causes of failure in the fruit business is the growing

¹ Construction—Rural Engineering S-7 + S-4.

of wrong varieties; varieties requiring a dry soil are set in a wet soil; tender varieties are set in a wet soil or where only hardy ones should be used; quality, productiveness, and season of ripening are ignored; and varieties are set which might be excellent in Ohio or Virginia or Missouri, but which cannot be grown profitably in Massachusetts.

This course aims to lay the foundation for a better state of things, and the student will be given a thorough drill on the leading varieties of the different fruits and will have an opportunity to test personally many of the leading varieties, especially of apples.

5 class hours a week.

Credits, 5.

Pomology S-2. (Orchard Production.) II.

This course deals with questions concerning the establishing and maintaining of fruit plantations.

It will include a full discussion of the choice of a site for the plantation. Many an orchard has failed simply because it was put in the wrong place. On another site on the same farm it might have been a conspicuous success.

The soil preferences of varieties of fruits will be considered, so that the student may avoid setting Rhode Island greenings where Baldwins should be grown, or Spies where Hubbards should stand.

The culture of fruit plantations will be considered, and the comparative value of sod and cultivation presented. Each system has its advantages and disadvantages. What are they, and under what conditions should each system be used?

Orchard implements will be discussed, examined, and tested, in order that the student may see for himself their good and bad points.

The question of cropping orchards will be discussed,—whether it is best to grow corn and beans and potatoes in the orchard, or to allow the trees to use all the land.

5 class hours a week.

Credits, 5.

Pomology S-3. (Harvesting, Marketing.) I.

This course will deal with the picking, packing, storing, and marketing of fruits. More men fail on these points than anywhere else in the fruit-growing business. There is a vast difference between good and bad cultivation or fertilizing of fruit plantations, but there is still more between good and bad picking or packing. The student in this course will have actual practice, so far as is possible, in the harvesting of all the fruits available in the college plantations. He will put these same fruits in storage, and will later grade them and put them up for market. At the same time, he will receive lectures on all phases of the subjects under consideration.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Pomology S-4. (Orchard and Vineyard Pruning.) II.

More fruit plantations are damaged by unintelligent pruning than by mismanagement in any other single operation. If the orchardist does not know that apple trees bear in spurs, he is very liable to cut these off in pruning, and so reduce his chances of a crop. If he is ignorant of the fact that the peach bears on last year's wood, he may remove most of this wood, and incidentally most of his crop. This course aims to give the student a thorough training in the theory of pruning and the methods of bearing of the different fruits.

At the same time, every student is required to do the work of pruning in the college orchards and vineyards until he becomes reasonably proficient with each kind of fruit.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Pomology S-5. (Spraying.) III.

In this course a careful study is made of modern methods of spraying. All the principal spray materials are studied, and the student is given practice in their preparation for use and in applying them to the orchard.

The department is well equipped with modern spraying apparatus, from bucket

pumps to large power outfits, and students are required to study the construction of these pumps, and to operate them in the orchards.

Spraying is very properly regarded as one of the most important operations in connection with growing fruit, and it is the aim of this course to train students to recognize the work of our common orchard pests, to prepare the proper materials for their control, and to apply these efficiently.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Pomology S-6. (Orchard Management.) III.

The work in orchard management includes a detailed study of such questions as the planning and laying out of fruit plantations so that they may be handled most economically; the cost of various operations, and methods of reducing expenses; efficient handling of labor on fruit farms; the use of labor-saving devices in fruit work; the most economical units in fruit production.

While orcharding will always be the leading phase of the fruit business in Massachusetts, there are many unusual opportunities for success in growing the various small fruits. This course will deal with the problems of establishing and handling successfully plantations of strawberries, raspberries, blackberries, currants, gooseberries, and grapes, including such questions as the choice of varieties; the best types of soils; laying off and setting the plantation; the proper fertilizing; methods of pruning and training. The college has large plantations of most of these fruits, so that the student will have ample opportunity for all types of practical work. Everything possible will be done to make the course of the utmost practical value, as well as to give the scientific principles on which our practices are based.

4 class hours and 1 2-hour laboratory period a week.

Credits, 5.

Pomology S-7. (General Course.) II.

This course is intended to meet the needs of students in the Animal Husbandry and Poultry majors who cannot devote more than one term to the subject of Pomology. The course deals with the practical side of the growing and marketing of fruits. Especial attention is given to such questions as selection of site for the plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing.

3 lectures and 2 2-hour laboratory periods a week.

Credits, 5.

FLORICULTURE

Students who complete the course in floriculture are fitted primarily for work in commercial greenhouse establishments and retail flower stores. After gaining experience, such students may be able to start in business for themselves. Those who elect the courses in general horticulture, also, should be qualified for positions on private estates, in parks, or in nurseries.

The offices and classrooms of the Department of Floriculture are located in French Hall. Of the two lecture rooms, one will accommodate 40 students, the other 90 students; a laboratory, equipped with slate-covered tables, will accommodate 40 students. In the basement of the building the department has a specially prepared room for bulb storage, a fertilizer and tool room, and a large room for general storage purposes.

The glass area of the department consists of approximately 20,000 square feet, divided as follows: French Hall, range of 7,200 square feet, a durable practical commercial range, composed of palm and fern, violet, carnation, rose, and students' houses the old Durfee range of 7,400 square feet, devoting to the growing of decorative, conservatory, and bedding plants and chrysanthemums; one house of 3,200 square feet, suitable for propagating work and general plant culture; and approximately 2,200 square feet in cold frames and hotbeds.

In addition, the department has 2 acres of land used for the summer culture of carnations, violets, gladioli, dahlias, sweet peas, bedding plants, etc. This includes a garden of about 4,700 square feet, devoted to the culture of annuals. A large collection of biennials and herbaceous perennials is maintained, and is being enlarged from year to year.

Floriculture

			FIRST YEAR		
<i>Fall Term</i>			<i>Winter Term</i>		<i>Spring Term</i>
Agronomy S-1 (Soils and Fertilizers)			Floriculture S-2 (Greenhouse Construction and Management)		Six months' farm placement training
Floriculture S-1 (Garden Flowers and Bedding Plants)			Horticulture S-1 (Plant Propagation)		
Pomology S-1 (Fruit Varieties)			Construction ¹		
Vegetable Gardening S-1			Business Law S-1		
			SECOND YEAR		
<i>Fall Term</i>			<i>Winter Term</i>		<i>Spring Term</i>
Floriculture S-3 (Commercial Floriculture)			Floriculture S-4 (Commercial Floriculture)		Floriculture S-5 (Conservatory Plants)
Horticulture S-2 (Plant Materials)			Horticulture S-3 (Plant Materials)		Horticulture S-4 (Plant Materials)
Horticulture S-5 (Construction and Maintenance)			Rural Sociology S-1 (Social and Economic Problems)		Motors S-2
Agricultural Economics S-1			Horticulture S-6 (Construction and Maintenance)		Horticulture S-7 (Construction and Maintenance)

Floriculture S-1. (Garden Flowers and Bedding Plants.) I.

This course is intended for students who will take up private estate work or who will specialize in floriculture. It will include a study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture, and uses will be considered. Laboratory exercises will include work in propagation, planting, study of materials, and planning of beds and borders.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Floriculture S-2. (Greenhouse Construction, Heating and Management.) II.

This course will take up the origin, growth, and importance of the floriculture industry; development of the greenhouse; types of houses and construction; methods of greenhouse heating; general principles of greenhouse management, including soils and their preparation, fertilizers, watering, ventilation, and fumigation; methods of propagation for plants grown under glass. Textbook: White's "Principles of Floriculture."

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Floriculture S-3. (Commercial Floriculture.) I.

Courses S-3 and S-4 will be devoted primarily to a consideration of the important commercial crops. Special attention will be given to the culture (under glass) of roses, carnations, chrysanthemums, violets, and sweet peas. Other cut-flower crops and various potted plants will also be considered. Textbooks required during the two courses will be: Holmes, "Commercial Rose Culture;" Dick, "Commercial Carnation Culture;" Smith, "Chrysanthemum Manual."

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Floriculture S-4. (Commercial Floriculture.) II.

A continuation of Floriculture S-3. In addition, a part of the course will be devoted to floral arrangement, including the general principles underlying the use of flowers in funeral designs and sprays, table decorations, corsages, vase, and basket arrangements.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Floriculture S-5. (Conservatory Plants.) III.

A study of the plants, both foliage and flowering, which are used in conservatories and in decorative work. Methods of propagation, culture, uses, and identification of plants will be included in the work.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

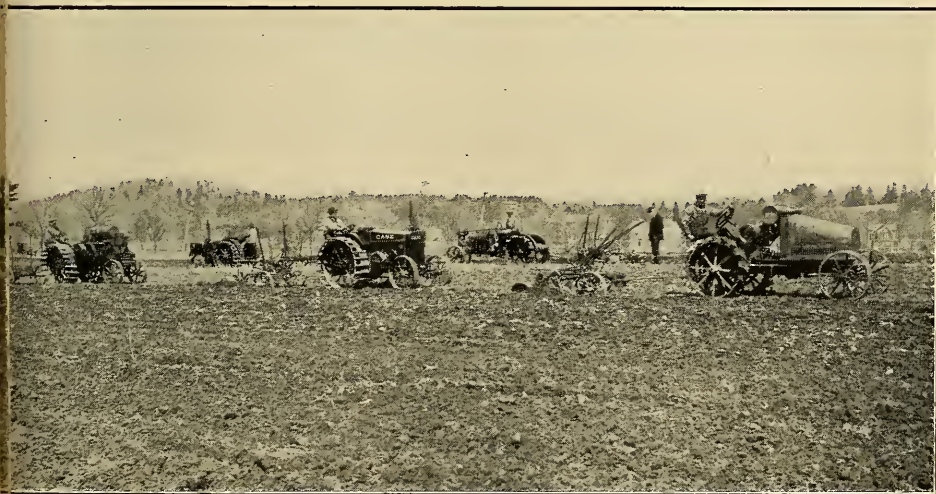
Floriculture S-6. (Greenhouse Management.) I and III.

A course of general nature intended for those who have not taken the other courses in floriculture. Students who have taken the other courses will not be

¹ Construction—Rural Engineering S-7 + S-4.



Fertilizer Mixing



Tractors at Work



allowed to register in this course. It will include a brief description of greenhouse construction and heating; general principles of greenhouse management, including soils and their preparation, fertilizers, watering, ventilation, and fumigation; methods of propagation for plants grown under glass; outlines of cultural methods for important greenhouse crops. Textbook: White's "Principles of Floriculture." 3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

VEGETABLE GARDENING

The business of vegetable growing is one of the leading types of agriculture in Massachusetts. Middlesex County is surpassed in the value of vegetables grown for sale by only four other counties in the United States. The value of vegetables grown for home use in Massachusetts is more per farm than in any other State in this country. The vegetable greenhouse district around Boston is one of the largest in the United States, and the only district growing head lettuce under glass. The Massachusetts markets for vegetables are considered by many to be among the best, for we are further removed from the large vegetable trucking sections than other large centers of population, while our markets demand high-quality vegetables.

This course is fitting men who wish to go into business for themselves to become market gardeners, truck farmers, and greenhouse vegetable growers. For those whose principal interest may be other types of agriculture the course has much to offer along the lines of special crops often spoken of as cash crops. For those who wish to work for someone else this course offers training such that its graduates are being placed in responsible positions with commercial vegetable growers, seed growers, and private estates.

Vegetable Gardening

FIRST YEAR		
<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Agromony S-1 Soils and Fertilizers)	Horticulture S-1 (Plant Propagation)	Six months' farm placement training
Floriculture S-1 (Garden Flowers and Bedding Plants)	Construction ¹	
Pomology S-1 (Fruit Varieties)	Business Law S-1	
Vegetable Gardening S-1	Pomology S-2	
SECOND YEAR		
<i>Fall Term</i>	<i>Winter Term</i>	<i>Spring Term</i>
Vegetable Gardening S-3	Vegetable Gardening S-4	Vegetable Gardening S-7
Pomology S-3 (Harvesting and Marketing)	Pomology S-4 (Orchard and Vineyard Pruning)	Pomology S-5, or—
Agriculture Economics S-1	Poultry S-6 (general)	Pomology S-6
Horticultural Manufactures S-1	Rural Sociology S-1 (Social and Economic Problems)	Motors S-2
		Horticultural Manufactures S-2, or—
		Entomology S-1 (Beekeeping)

The business of vegetable gardening may be entered with a limited outlay of capital, for the returns on the capital invested are quickly secured, as some vegetable crops mature in a very few weeks, which enables one to turn over his capital from one to three times per season. The nature of this business is such that one locates as near the market as possible, and because of the growth of our cities, vegetable growers, as a group, have profited much by an increase in land values.

The Vegetable Gardening Department has 10 acres of land, 3,500 square feet of greenhouse space, and 500 linear feet of hotbeds and cold frames. These are used to give the student thorough practical training in the fundamentals of vegetable growing, plant production, and vegetable forcing. The office, classroom and laboratory are located in French Hall.

Vegetable Gardening S-1. (Garden Farming.) I.

Students will find this course one which will fit them to carry on estate work, to make the best use of the farm home garden, or to go on with commercial vegetable growing. This is a well-rounded course, studying vegetables from the standpoint of types. The student will work with the leading types of the common vege-

¹ Construction—Rural Engineering S-7 + S-4.

tables, learning their requirements. Special attention will be given to the harvesting and storage of crops for winter and fall preparation of the land.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Vegetable Gardening S-2. (Commercial Vegetable Gardening.) II.

"As a prospective commercial vegetable grower and a producer of food, what must I know of the value of vegetables as a food, their history, present extent of this business and the outlook for the future?" These facts are studied as well as many of the fundamentals of vegetable production. Practical work will consist of vegetable seed study, seed germination, and production of vegetable plants under glass. Special care will be given to acquaint the student with the importance of detail, so that he will be able to make the best of the six months' training with some of the leading vegetable growers of this State.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Vegetable Gardening S-3. (Types and Varieties.) I.

Success or failure in vegetable production depends upon the proper selection of types and varieties. Market demands differ in different sections, and there is a difference in the types produced from various seed sources. This department maintains a variety garden, growing some 250 or more varieties of vegetables, so as to train the student in the proper selection of types and varieties. Study is given to the source and desirability of good seed. The importance of high quality and good appearance of vegetables is kept before the student so that he will be fitted to better judge and exhibit vegetables.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Vegetable Gardening S-4. (Vegetable Forcing.) II.

The demand is increasing for fresh vegetables out of season, and Massachusetts markets are among the best for these types of vegetables. There are many large greenhouse plants in the State, and this course meets a real demand by giving the student training in the production of vegetables out of season. There is a demand for the men with this training. The student will try out the latest and best methods of caring for greenhouse crops.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Vegetable Gardening S-6. (Vegetable Crops for the General Farm.) III.

Many of the vegetable crops are of such a nature that they can be successfully grown as a side line to other types of farming. Special emphasis will be given to those crops which the men interested in animal husbandry can use for a money crop or for stock-feeding purposes. The farm home garden is important for any farm, and here in this State the yield from such gardens is greater than in other States. As the area on the general farm devoted to vegetables is one of the most productive in money value, this course will show the student how to make the best use of this farm home garden.

3 class hours, 2 2-hour laboratory periods a week.

Credits, 5.

Vegetable Gardening S-7. (Problems in Commercial Vegetable Gardening.) III.

In order to understand the best methods of growing vegetables on a commercial scale the student must be acquainted with the principles underlying these practices.

Weekly assignments dealing with specific problems as encountered in the actual business of growing vegetables commercially are worked out by the students. Such problems as weather and market reports, the purchase of seeds, fertilizers and equipment, spring preparation of the soil, the study of various forms of machinery used by the market gardener, the identification of and methods of control of obnoxious weeds, injurious insects and diseases, are included in the course. Organized trips to market garden sections of the Connecticut Valley and the vicinity of Boston are part requirements of this course.

1 2-hour class period per week, 4 1-hour outside laboratory periods per week.

Credits, 5.

GENERAL COURSES FOR WOMEN

There was offered in the fall of 1922, for the first time, a general course for those young women who do not want to specialize in any one branch of agriculture, but who want preparation for rural life. This course includes such agricultural and home economic courses as the country girl would be most likely to use, both for profit and for pleasure. This course should appeal to many young women whose home is on a farm or in a small town; or those who hope some time to live in the country.

General Course for Women

		FIRST YEAR			
<i>Fall Term</i>		<i>Winter Term</i>		<i>Spring Term</i>	
Agronomy S-1		Horticulture S-1		Six months' farm placement training.	
Floriculture S-1		Business Law S-1			
Rural Sociology S-1		Home Economics S-2			
Home Economics S-1		Microbiology S-1 (Sanitation and Hygiene)			
Agricultural Opportunities for Women S-1					
		SECOND YEAR			
<i>Fall Term</i>		<i>Winter Term</i>		<i>Spring Term</i>	
Agricultural Economics S-1		Poultry S-6 (general)		Horticultural Manufactures S-2	
Animal Husbandry S-6 (general)		Pomology S-7 (general)		Vegetable Gardening S-6 (general)	
Home Economics S-3 or S-4		Home Economics S-5		Home Economics S-6	
Horticultural Manufactures S-1		Dairy S-1 (general)		Entomology S-1, or—	
				Floriculture S-6, or—	
				Poultry S-5	

RELATED SUBJECTS IN OTHER DEPARTMENTS

Agricultural Opportunities for Women S-1. I.

Agriculture is a field in which women are finding increasingly good opportunities. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences.

2 class hours a week.

Credits, 2.

Home Economics Department.

Agronomy S-1. (Soils and Fertilizers.) I.

In this course will be studied the origin and formation of soils; classes and types of soils; the control of soil moisture; tillage operations; organic matter, its importance and maintenance; acid soils and liming; commercial fertilizers. Considerable time will be devoted to actual work with fertilizing materials, and the student will be expected to become thoroughly familiar with farm manures, forms of agricultural lime, and commercial fertilizers—their composition, properties, care, and use.

3 class hours, and 2 3-hour laboratory periods a week.

Credits, 5.

Agronomy Department.

Agronomy S-2. (Crops.) III.

A course covering the production of field crops and including a study of their adaptation to soils and climate; varieties and the selection of seed; the preparation of the soil; fertilization, planting, cultivation, care, harvesting, and use of field crops. Special attention will be given the establishment and improvement of mowings and pastures in Massachusetts. Corn, oats, rye, barley, buckwheat, grasses, clovers, vetches, beans, peas, potatoes, and root crops will be studied. Actual practice with growing crops in the field and greenhouse, and with prepared specimens in the laboratory, including the judging of corn and potatoes, will be given.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Agronomy Department.

Agricultural Economics S-1. (Marketing.) I, II.

The purpose of this course is to present the business side or economics of agriculture. It is based upon the principle that products are made to sell, that the real object is to produce large money returns. The goal is the largest possible net profits with a given amount of land, labor, money, and equipment. The course deals with the possible types of profitable commercial agriculture in New England;

the present location of the most profitable farming sections, the choice of a farm; the necessary investment, and the proportion to invest, in land, in improvements, in stock and equipment, and in reserves for labor and supplies on different kinds of farms.

Another section of the course treats of the principles of farm credit. Who should borrow, sources of credit, mortgage credit, farm loan associations, land banks, personal credit, national bank loans, credit unions, terms of credit, and how to use credit profitably are some of the topics studied.

Another division of the subject is marketing farm products. This will be treated in a very practical manner. The following are some of the topics: marketing as a part of production; outlets of the sale of farm products; principles of marketing; description of wholesale methods of distribution; middlemen, functions, and abuses; methods of sale, prices of farm products; price quotations; government aid in marketing; direct marketing; co-operative buying and selling; methods of successful co-operation; farmers' exchanges in Massachusetts; how to organize successfully.

Each student will be required to select some principal product in which he is interested, and make a careful study of its production, handling, and marketing on a profitable commercial scale. This course is given by the Department of Agricultural Economics. Lectures, textbook, original study, and report.

5 class hours a week.

Credits, 5.

Department of Agricultural Economics.

Business Law S-1. II.

The work of this course will cover such points as land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper, and distinctions between personal and real property. Text, written exercises, lectures, and class discussions.

5 class hours a week.

Credits, 5.

Entomology S-1. (Beekeeping.) III.

This course comprises a general consideration of the biology of the honey bee and the elements of practical beekeeping. Some topics covered are: life history, general behavior and instincts, structure, products, relations of bees to plants, the honey flora. The course aims particularly to afford first-hand practical experience with bees, to the end of enabling their proper maintenance for any purpose,—horticultural, educational, or agricultural. Bee diseases, a thorough understanding of which is fundamental, are emphasized. So far as possible, the work is made individual in constructing materials and apparatus and in the manipulation of bees.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Entomology Department.

Farm Management S-1. (Farm Management and Accounts.) II.

A study of farming as a business; the correlation and adaptation of different farm enterprises, as dairy, orchard, poultry, to the specific farm; land, labor, and capital requirements; farm and building, plans and arrangements; the choice and purchase of a farm. Several laboratory periods will be devoted to practice in farm accounting. Farm experience is a prerequisite to this course.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Department of Farm Management.

Forestry S-1. (Woodlot Management.) II.

A course in tending, harvesting, marketing, and renewing the forest crop, with particular reference to the problems of the farm woodlot. The instruction is mainly practical, and is conducted in the field, with a minimum of bookwork; but there is a constant emphasis upon the development of keen and imaginative observation, and the acquisition of the conservationist point of view. Opportunities for field work are varied and extensive. There are woodlots of several types on or near the campus, and students have the fullest use of the Mt. Toby

Demonstration Forest, a 750-acre tract 7 miles distant, belonging to the college and managed by the Forestry Department.

2 class hours and 1 4-hour and 1 2-hour field periods a week.

Credits, 5.

Forestry Department.

Home Economics S-1. (Clothing.) I.

An important problem in the home today is the selection of fabrics; therefore their character, cost, and durability are studied with reference to planning a wardrobe for a limited income.

Consideration will also be given to the principles of design, appropriateness, and simplicity in dress to develop good taste.

There will be practical work in sewing and making garments.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Home Economics Department.

Home Economics S-2. (Foods.) II.

Every woman concerned with the welfare of the family is interested in the problem of nutrition. To select food wisely, and to prepare it, that the greatest amount of nutrition may be saved, is of the utmost importance.

Special study will be made of the needs of the body and the selection of foods to supply those needs; also care in the handling and keeping of foods, and planning meals for efficiency and economy.

Balanced menus are not vague and mysterious, but result from the application of a few fundamental principles. Many people are underfed, not from a lack of food, but from an unwise choice.

This course will include laboratory work of practical value.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Home Economics Department.

Home Economics S-3. (Clothing.) I.

A continuation of course S-1, which is a prerequisite for this course.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Home Economics Department.

Home Economics S-4. (Goods.) I.

A continuation of course S-2, with special emphasis upon the planning and serving of the meals. Consideration will also be given to special problems of nutrition.

Course S-2 is a prerequisite for this course.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Home Economics Department.

Home Economics S-5. (Home Management.) II.

There are many efficient methods successfully used in the business world which can be applied in the business of home-making.

Since the home-maker is largely responsible for all expenditures connected with the house, an important consideration in this course is the study of the family budget, the apportionment of the income, and the keeping of accounts.

Equally important is the standardization of household tasks, the study of systematic methods of work, selection and care of equipment, and the use of time and labor saving devices.

5 class hours a week.

Credits, 5.

Home Economics Department.

Home Economics S-6. (Home Nursing.) III.

It should be far easier to keep well than to become sick, provided one understands the fundamental principles of hygiene, thus insuring the care of the family health.

However, every home-maker needs some knowledge of home care of the sick, including the study of simple diseases and their prevention, the care of young children and invalids, and first aid to the injured.

5 class hours a week.

Credits, 5.

Home Economics Department.

Horticultural Manufactures S-1. I.

The utilization of culls and low grades of fruits and vegetables is becoming a more important problem each year. Producers should be able to market their whole crop at a profit. The general problems studied in this course will be: the manufacture of apple products from cull apples; the canning of all fruits and vegetables available at this season, together with the manufacture of their various products, such as jams, jellies, conserves, pickles, etc.

Students will be required to keep accurate costs of materials in all canning and manufacturing operations, together with a record of methods used.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Department of Horticultural Manufactures.

Horticultural Manufactures S-2. III.

This is a continuation of Course S-1. The preservation of small fruits, together with the manufacture of their products, the evaporation of fruits and vegetables, the manufacture of maple products, and the canning of spring vegetables are the principal subjects studied. Prerequisite: Horticultural Manufactures S-1.

2 class hours and 3 2-hour laboratory periods a week.

Credits, 5.

Department of Horticultural Manufactures.

Microbiology S-1. (Hygiene and Sanitation.) II.

Deviation from health, from the normal being, is disease. The human body is susceptible to deviation from health. Certain elements are responsible for the entrance of disease into the body. The body becomes weakened through exposure, lack of exercise, unsuitable food, abuses. Under such circumstances it lays itself open to attack. There is the attack from within, which consists of some organic derangement, and the attack from without, which makes it possible for foreign enemies, agents, or micro-organisms to enter.

Closely associated with the production of disease are intermediaries and casual factors, as ventilation, water-supplies, sewage disposal, and food. They serve as vehicles for disease agents. The germs of disease find their way through them, and are carried by them. Besides, human contact seems to be the most important disseminator, and insects and animals may harbor or convey, and in some instances instigate, disease.

Then there are those conditions which react on the body in a physical manner and influence its mechanism and its operating facilities, as mental disturbances, character of food, conditions of living.

It is the purpose of this course to discuss the nature of diseases, what causes them, the significance of sanitation and hygiene in preventing them, and the methods of control; in other words, to study, in the light of present knowledge, how to preserve health and prevent deviation from health.

5 class hours a week.

Credits, 5.

Microbiology Department.

Microbiology S-2. (Dairy Bacteriology.) I.

Bacteria and other micro-organisms are the responsible agents for the changes which occur in milk and for the contagion which sometimes causes diseases. They are found in milk at times when leaving the udder, they get in with the dust and dirt while milking, and they adhere to the dairy utensils, which carry them over from one milking to the next. From the cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster, on the other. All steps taken are significant in their control. The milking process, the handling of the cow, the condition of the milker, the cleansing of utensils, the management of the stable, the feeding, straining, aeration, cooling, clarifying, pasteurizing,—all are steps in the control of micro-organisms.

Many kinds of changes take place in milk, due to different kinds of micro-organisms. Many of these changes are sought, as the ripening of cream for butter, of milk for cheese, of milk for milk drinks; and many of these changes, also, are fought against, as ropy milk, sour milk, bitter milk, tainted milk, etc.

Micro-organisms of typhoid fever, scarlet fever, diphtheria, and others not infrequently find their way through the milk to the consumer, and produce epidemic forms of these diseases.

It is evident, therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of the substance of this course. This course is required of all students who elect dairying as one of their special lines of work.

5 2-hour laboratory periods a week.

Credits, 5.

Microbiology Department.

Rural Engineering S-1. (Farm Engineering.) I.

This course is intended to familiarize the student with the various types of farm implements, to teach him their operation and care, and give practice in the adjustment and repair of the mechanical equipment on the farm.

The various types of field implements are studied, and emphasis is laid on the selection of implements suited to New England conditions. The adjustment of machines is discussed and the student is given practice in setting machines for different field conditions.

Part of the course is given over to the repair of farm equipment. In this work part of the time is given over to blacksmithing and the balance to such exercise as soldering, babbitting and fitting bearings, lining up shafting, pipe fitting, threading bolts and nuts, and practice in tying knots and splicing rope. Farm implements are brought in and overhauled to give practical work in this line. In the limited time available it is not expected to make a blacksmith or mechanic out of the student, but it is hoped that the student will learn to know the tools used and get sufficient practice in their use so that he can make repairs on his own equipment.

Part of the course is given over to the study of water supply systems, including pumps, rams, and complete power systems. Farm-lighting plants are also studied, attention being given to selection, as well as care and operation. The principles underlying the practice of farm drainage are discussed, and practice is given in the use of simple leveling instruments for the purpose of accurately grading tile drainage ditches.

2 lectures and 3 2-hour laboratory periods a week.

Credits, 5.

Rural Engineering Department.

Rural Engineering S-2. (Farm Motors.) I, III.

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing.

3 class hours and 2 2-hour laboratory periods a week.

Credits, 5.

Department of Rural Engineering.

Rural Engineering S-3. (Carpentry.) I, II.

This course gives practice in the care and use of carpenters' tools through bench work, repair of farm equipment, and building construction. Small buildings are erected by the students to give practice in all the phases of house construction. Practice is given in the building of forms and in the mixing and placing of concrete. (Must be taken with Rural Engineering S-7.)

2 2-hour laboratory periods a week.

Credits, 2.

Department of Rural Engineering.

Rural Engineering S-4. (Repair of Farm Equipment.) II.

The object of this course is to give practice in the handling of tools, which will help in the repair of farm machines and miscellaneous farm equipment. Practice is given in forging, including drawing and shaping iron and steel, welding and tempering edged tools, and general blacksmith's repairing. Exercises also include pipe fitting, soldering, splicing rope, belt lacing, and babbitting and adjusting bearings.

Practice is given in the use of machinists' tools, such as cold chisel, file, taps and dies, drill press, and lathe. (Must be taken with Rural Engineering S-7.)

2 2-hour laboratory periods a week.

Credits, 2.

Department of Rural Engineering.

Rural Engineering S-5. (Dairy Mechanics.) III.

This course is planned for men who are fitting themselves to take charge of dairy plants or allied lines of work. A study of steam boilers, steam engines, steam turbines, pumps, steam traps, line shafts, belting, electric motors, milking machines, and refrigeration plants.

3 class hours and 1 4-hour laboratory period a week.

Credits, 5.

Department of Rural Engineering.

Rural Engineering S-7. (Farm Structures.) I, II.

A study of the building materials commonly used in farm construction; details of construction and simple structural mechanics; the principle of design of such farm buildings as the dairy stable, hog house, horse barn, general purpose farm, fruit and vegetable storage buildings, etc.

In the drafting room practice will be given in the use of drawing instruments, and instruction given in the fundamentals of mechanical drawing. Each student will have opportunity to design in complete detail one of the major farm buildings in which he is particularly interested. (Must be taken with Rural Engineering S-3 or S-4.)

1 class hour and 2 2-hour laboratory periods a week.

Credits, 3.

Department of Rural Engineering.

Rural Sociology S-1. (Social and Economic Problems.) I, II.

The purpose of this course is to acquaint the students with present-day problems of economics, sociology, and politics. The first part of the course will deal with general problems. During the second part a study will be made of the social, economic, and political aspects of rural community life, readings, discussions, and written reports.

5 class hours a week.

Credits, 5.

Department of Rural Sociology.

Veterinary Science S-2. (Animal Diseases.) III.

This course acquaints the student with the more common diseases to which domesticated animals are susceptible. Particular attention is given to conditions favoring diseases, to communicable diseases, and to prophylactic measures, in order that the student may be able to reduce the prevalence of disease among animals in his charge.

5 class hours a week.

Credits, 5.

Department of Veterinary Science.

SHORT COURSES AT THE MASSACHUSETTS AGRICULTURAL COLLEGE

Short Courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore, there is no age limit. Enrolled in short courses are found the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty years Short Courses have served hundreds of students in this Commonwealth, and the demand for these courses in recent years has been even greater than in the past.

A ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY

J. C. GRAHAM, LUTHER BANTA, W. C. SANCTUARY, Dr. J. W. PATTON, Miss
MARION PULLEY, *Staff.*

The One-Year Vocational Poultry Course is designed to meet the needs of those who wish to specialize in this branch of agriculture, but who can spend only one year at the college. The course is vocational in its nature, the plan of which is to "learn to do by doing."

During the winter term the students take Course 1, Elementary Poultry Keeping, and elect about fifteen credits from other subjects listed in Course 6. From the close of the Winter School, about March 10, until college closes, the latter part of June, they devote all of their time to poultry work. During the summer vacation students have an opportunity to secure additional practical experience on general or specialized farms. With the opening of college in the fall, students again devote all of their time to poultry work, finishing the course at the end of the fall term, the latter part of December. As the busy season with poultrymen begins soon after the first of the year, the students, by finishing the course before the holiday season, are ready to accept attractive positions or enter business for themselves.

Course of Study

Course 1. Elementary Poultry Keeping. A textbook course supplemented with lectures, recitations, etc., covering the entire field of elementary poultry keeping, special emphasis being laid upon the following subjects: opportunities in poultry keeping, poultry house construction, feeds and feeding, breeds and breeding, incubation, brooding, growing stock, marketing, and poultry diseases. Five recitations per week throughout the year.

Course 2. A practical laboratory course covering the following subjects: carpentry, fattening, kiloing, picking, dressing, caponizing, avian anatomy and physiology, making and applying disinfectants and lice powder, also identification and study of poultry feeds, etc. Two laboratory periods per week from October until December, inclusive.

Course 3. Poultry Judging. Fall term. A study of the "Standard" and economic classification of poultry, including score card and comparative judging of exhibition and utility poultry for egg and meat characters. Selecting hens for high and low production (or culling) will receive special emphasis in this course. "The American Standard of Perfection" will be used for a text. Two two-hour laboratory periods per week.

Course 4. A practical laboratory course in incubation, brooding, and growing stock. Students receive practice in operating small and mammoth incubators as well as kerosene and coal stove brooders. Some time is devoted to natural incubation and brooding. Equivalent to five laboratory periods per week from March to June, inclusive.

Course 5. A conference, observation, and general reading course, equivalent to one or two recitations per week during the spring and fall terms. In this course the student will become thoroughly acquainted with the best literature on poultry subjects through books, station bulletins, scientific articles, poultry magazines, etc. A thorough discussion of the problems met by the practical poultryman is a strong feature of this course.

Course 6. Supplementary Courses. Each student shall select from the winter short course enough of the following subjects to give him at least 12 to 18 credit hours: pomology, soils, agronomy, rural engineering, beekeeping, market gardening, animal husbandry, farm management, dairying, etc.

Course 7. Poultry Management. A general poultry practice course in the care and management of poultry, the work to be done morning, noon, and

night, and other periods as necessity requires, the class to be responsible for the work in caring for specified flocks, under the supervision of instructors, from March until college closes, and from October until December, inclusive. Equivalent to six two-hour periods per week.

Entrance Requirements

Applicants must be at least eighteen years of age and have a good elementary education.

Fees

There is no tuition for residents of Massachusetts, but a laboratory fee of \$5 is required for the fall term and the same for the spring term.

THE SUMMER SCHOOL

The college has maintained a Summer School for the past sixteen years. The Summer Course is intended for high school teachers, teachers of agriculture, instructors in home economics, and for students who wish courses in agriculture and horticulture. The course lasts six weeks, beginning about the first of July and continuing through the month to about the second week in August. All courses offered, if successfully completed, carry collegiate credit.

The following schedule of courses, offered in 1925, indicates the nature of the work:—

Principles and Methods of Teaching	Millinery
General Psychology	Foods
Methods of Teaching English in the High School	The Nutritional Phases of Health Education
Methods of Teaching and Supervision of Mathematics	Methods of Teaching Home Economics
Content and Methods in Social Studies in High School	Food Preservation
Principles of Secondary Education	General Science
Special Methods in Teaching Vocational Agriculture.	Studies in Science
Tests and Measurements	Public Health
Supervised Teaching	Design and Practical Arts
Advanced Educational Psychology	Flower Growing
Modern Philosophy of Education	Botany for the Teacher
The Employed Teacher of Agriculture	Cultivated Trees and Shrubs
Vocational Education	Dramatic Presentation
Elementary Clothing Problems	Freshman English
Advanced Clothing	Preparatory Algebra
Textiles	College Entrance English
	Plane Geometry
	Higher Algebra

THE WINTER SCHOOL

The Winter School has been established for a number of years at the college, and has proved to be very popular with farmers, their wives, sons, and daughters, teachers, college graduates, and others. This school begins about the first of January. Instruction was offered last year in—

Soil Fertility	Supplying and Marketing of Farm Products
Field Crops	Sources and Use of Agricultural Credit
Types and Breeds of Live Stock	Botany
Live-stock Feeding	Entomology
Animal Breeding	Farm Structures
Dairy Bacteriology	Farm Motors
Animal Diseases	Rural Sanitary Science and Hygiene
Poultry Diseases	Agricultural Opportunities for Women
Poultry Husbandry	Foods
Fruit Growing	
Vegetable Gardening	

Floriculture
Horticultural Manufactures
Farm Management
Farm Accounts

Millinery
Clothing
Business of the Household
Home Care of the Sick
Agricultural Education

A series of special two-week courses in ice-cream making, butter making, milk testing, and market milk are offered. During the two weeks the student devotes all of his time to the work of the special course in which he has enrolled. The instruction lasts throughout the day from 8 to 5. These courses meet a very definite need in the State for those who wish instruction, but who cannot attend for a longer period of time, and who do not wish to take other subjects.

DIRECTORY OF INFORMATION

A. The College.

Those desiring college catalogues, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address Ralph J. Watts, Secretary, Amherst, Mass.

All questions regarding admission to the college, either to the freshman class or to advanced standing, should be addressed to Prof. William L. Machmer, Acting Registrar, Amherst, Mass.

B. Experiment Station.

The Experiment Station conducts investigations in as many lines of agricultural science and practice as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs, and milk-testing apparatus. Branch stations in cranberry and market-garden culture are maintained in other sections of the State.

The station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections, and for other information on the work of the station, should be addressed to Sidney B. Haskell, Director of the Experiment Station, Amherst, Mass.

C. The Graduate School.

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Charles E. Marshall, Director of the Graduate School, Amherst, Mass.

D. The Extension Service.

Inquiries of a general nature regarding the work of the Extension Service, extension publications, or requests for new lines of work should be addressed to John D. Willard, Director of Extension Service, Amherst, Mass.

E. Short Courses.

For information concerning the Short Courses, the Two-Year Course in Practical Agriculture, the Ten-Weeks Winter School, the Summer School, write or apply to Roland H. Verbeck, Director of Short Courses, Amherst, Mass.

**APPLICATION FOR ENROLLMENT
IN THE
TWO-YEAR COURSE IN PRACTICAL AGRICULTURE**

Name..... Date

Post-Office Street State

Present Occupation

Previous Education.....

References as to character:

1
Name Address

2.
Name Address

Certificate of Citizenship

The Massachusetts Agricultural College charges a tuition fee of \$60 a term to students who are not residents of Massachusetts. In order to satisfy the college authorities that an applicant is entitled to free tuition they require a statement, signed by the clerk of the city or town in which the applicant resides, certifying to the fact that the father of the applicant is a legal resident of said city or town. Such a statement may be made on the form below. If this is not presented when the student registers, the Treasurer has no option but to collect tuition on the above basis.

.....
To the President of the Massachusetts Agricultural College.

This is to certify that on the date specified below, the father of.....

.....
is a legal resident of

Signed

Date
(Seal)

Mail this blank to Roland H. Verbeck, *Director of Short Courses*

MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST, MASS.



MASSACHUSETTS AGRICULTURAL COLLEGE

THE TEN WEEKS' WINTER SCHOOL

1926



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<i>Foreman, Pomology Department</i>	
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<i>Instructor in Horticultural Manufactures</i>	
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EDNA L. SKINNER, B.Sc.	Home Economics
<i>Professor of Home Economics Head of Department, Adviser of Women</i>	
GRANT B. SNYDER, B.Sc. Agr.	Vegetable Gardening
<i>Instructor in Vegetable Gardening</i>	
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<i>Instructor in Agronomy</i>	
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<i>Professor of Floriculture, Head of Department</i>	
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<i>Professor of Pomology</i>	
PAUL W. VIETS	Short Courses
<i>Supervisor of Farm Placement Training</i>	
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<i>Professor of Agricultural Education, Head of Department</i>	
T. GEORGE YAXIS, M.Sc.	Dairying
<i>Assistant Professor of Dairying</i>	

THE TEN WEEKS' WINTER SCHOOL

January 4, 1926 to March 12, 1926

The Winter School has been maintained by the college for over twenty years. It meets a definite need in providing instruction for groups of men and women who can most conveniently leave the farm during the winter months. The school closes in time for students to return to take up the spring work.

In addition to the regular Winter School, the attention of the student is directed to the following special schools offered during the winter period:—

The Practical and Scientific Course for Florists.

The Vocational Poultry Course.

The Dairy School.

In order that the Winter School may serve as many people of the Commonwealth as wish to take advantage of it, no entrance requirements have been fixed other than that the student shall be at least eighteen years of age and shall have completed the elementary or common schools. The expenses are very moderate.

The instruction is thorough. The regular faculty teach the Winter School, assisted, if necessary, by additional instructors and lecturers from outside.

There are no required courses. The advice of the faculty in regard to the course may be had, but the students are left free to select the courses in which they are interested.

A social program is arranged for the Winter School in order that students may enjoy the advantages of college life. One of the most pleasant features of the Winter School in previous years has been the strong group spirit developed through wise leadership on the part of the student body.

The college does not guarantee positions, but frequently has calls for capable, energetic men and women with farm experience. Students interested in securing positions should consult the Supervisor of Farm Placement Training early in the winter. Employers who wish to secure the services of reliable men are also advised to take the matter up directly with the Supervisor of Farm Placement Training in the Short Course Office.

TUITION, FEES AND EXPENSES

There is no tuition in the Winter School, but each student is required to pay to the Treasurer a \$5 registration fee. There are no laboratory fees in connection with any of the courses. The registration fee, unless sent in advance, must be paid at the time of registration to the Treasurer of the college.

Board may be obtained at the college dining hall for approximately \$7 a week. Rent for furnished rooms in private houses varies in price from \$2.50 to \$4 a week for each occupant.

Rooms for women may be secured in private homes. The Short Course Office will be glad to assist students in locating rooms.

REGISTRATION

Students will be registered in classes Monday, January 4, at the Short Course Office. Classes will begin Tuesday, January 5, at 8 o'clock A. M.

Each student wishing to register for the Winter School must furnish in advance the names and addresses of two citizens who will recommend him as to moral character.

Upon arrival the student should report at the office of the Director of Short Courses, located in South College; telephone 424.

RULES AND REGULATIONS

The choice of subjects is left to the student, but students are advised to elect not less than ten nor more than twenty-five hours per week. All variations from this rule must be approved by the Director of Short courses.

A class that meets for one hour a day for five days per week is reckoned as five credit hours. A two or three hour laboratory period counts as one class hour.

Information in regard to books used in the various courses will be given by

the instructors at the first meeting of the class. The necessary textbooks may be purchased at the Treasurer's office.

As a guide to those who come to the college for the first time, the following extracts are taken from the regular rules of the college:—

The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standard of student deportment.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right not only to suspend, but also to name conditions under which students may remain in the institution.

Regularity of attendance and conformity to general college rules are required of all Winter School students.

The Library

The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 73,000 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the college. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers, are regularly taken and both the current numbers and the back files are readily accessible.

The Library is believed to rank with the best of its kind.

The Library is open for readers from 8 A.M. to 10 P.M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

Short Course Students will find in the Library helpful material of many sorts in connection with their work, and are cordially invited to make use of this material. The librarian and library assistants are always on hand, ready and anxious to help.

THE INFIRMARY

The college maintains an infirmary for the care of sick or injured students. Students are urged to go to the infirmary when in need of the services rendered by the resident nurse or by a physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that students will go to the infirmary at his suggestion.

The infirmary fee is \$2 a day, and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights.

SCHOLARSHIPS

The Jewish Agricultural and Industrial Aid Society of New York instituted in 1908 a system of free scholarships to enable the children of Jewish farmers to attend the short winter courses offered by the agricultural colleges in the states in which they reside. The scholarships are awarded by competition, which consists in the writing of a brief essay on an agricultural topic. Children of Jewish farmers living and working on the farms of their parents are eligible to compete for these scholarships.

Applications for these scholarships should be made to The Jewish Agricultural and Industrial Aid Society, 174 Second Avenue, New York City.

POSITIONS

A student desiring a recommendation from the college must meet the following conditions:—

1. He must be of good character.
2. His previous record must be good.
3. His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of farm experience cannot, as a rule, be recommended for positions of responsibility. This is especially true for the better positions for which managers or superintendents are wanted.

DESCRIPTION OF COURSES

GENERAL AGRICULTURE

Soil Fertility

A course in which the origin of soils, their properties and management, will be studied. Emphasis will be placed on: the control of soil moisture; tilth and tillage; importance and maintenance of soil organic matter; manures,—their composition, value, preservation, and use; limes and liming; and the properties and use of commercial fertilizers. Two class hours and one two-hour laboratory period.

Mr. C. H. Thayer

Field Crops

The production of field crops for New England; species and varieties, agricultural characteristics, methods of culture, rotations, harvesting and curing. The laboratory work gives the student practice in seed selection and testing for quality, purity and germination, and in corn and potato judging. Course 1 required. Two class hours and one two-hour laboratory period a week.

Assistant Professor Michels

Types and Breeds of Live Stock

Outlines of the market classes and grades of beef cattle, horses, sheep, and swine, placing emphasis upon the characteristics of each class and its adaptations. The characteristics, the adaptations, and so far as is possible the historic development of each of the more important breeds of live stock are also carefully studied, as well as their distribution in America. Special emphasis is laid upon dairy cattle and horses in the judging work. Three class hours and two two-hour judging periods a week.

Live Stock Feeding

A study of the physiology of nutrition, the composition of feedstuffs, and of rational economic feeding. The feeding of dairy cattle and their management for profitable milk production receives first attention. Similarly, the feeding of horses, of beef cattle, of sheep, and of swine is studied. Three class hours a week.

Assistant Professor Glatfelter

Animal Breeding

A discussion of the more common problems pertaining to the breeding of live stock, their explanation and solution; in-breeding; cross-breeding; grading. The work of the most successful men in history is studied. Time is given to the study of pedigrees of the different breeds of dairy cattle and other stock. Three class hours.

Assistant Professor Rice

Farm Management

A study of some of the problems of modern farming and the factors that influence success, such as the choice of a region and of a farm, types of farming, size of farm, rotation of crops, and labor problems. Two class hours a week.

Assistant Professor Abell

Farm Accounts

Actual practice in the use of a simple system of farm accounting, including

cost accounts suitable for the large or the small farm. Two two-hour laboratory periods a week.

Assistant Professor Abell

Farm Motors

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing. Three class hours and two two-hour laboratory periods a week.

Professor Gunness and Mr. Pushee

Dairy Bacteriology

The characteristics and functions of bacteria and their relation to the different branches of the dairy industry. The scientific basis for cream ripening, sterilization, pasteurization, control of fermentation, and the production of the best quality of market milk. Two class hours and one two-hour laboratory period a week.

Professor Marshall and Miss Garvey

Animal Diseases

This course acquaints the student with the more common diseases to which domesticated animals are susceptible. Attention is given to conditions favoring diseases, communicable diseases in particular, and to prophylactic measures, in order that the student may be able to reduce the prevalence of diseases among animals in his charge. Five class hours a week.

Dr. Lentz

Poultry Diseases

This course is planned for students specializing in poultry work. Anatomy and physiology of the domestic fowl are briefly considered, and particular attention is devoted to the diseases which may cause heavy losses in the flock. Prevention rather than cure is emphasized. Two class hours and one laboratory period per week.

Professor Sanctuary

Poultry Husbandry

This course meets the needs of those who can spend only a short time at the college, but who wish to get a general survey of poultry keeping and some technical knowledge of the latest and most scientific methods in vogue. It is a lecture and laboratory course, the former covering opportunities in poultry culture, poultry housing, winter egg production, incubation and brooding, feeds and feeding, poultry management, and the most popular methods of marketing poultry and eggs in Massachusetts. The laboratory work consists of demonstrations and practical work in killing, picking, caponizing, judging and culling for egg production, and studying types and construction of incubators and brooders. Practical work in operating incubators is given to as many as can be accommodated. The large poultry plant furnishes facilities for demonstrating various methods of housing and feeding. A splendid opportunity is afforded to those who have time for observation work outside of class hours. Five class hours and one two-hour laboratory period per week.

Professor Sanctuary

Vegetable Gardening

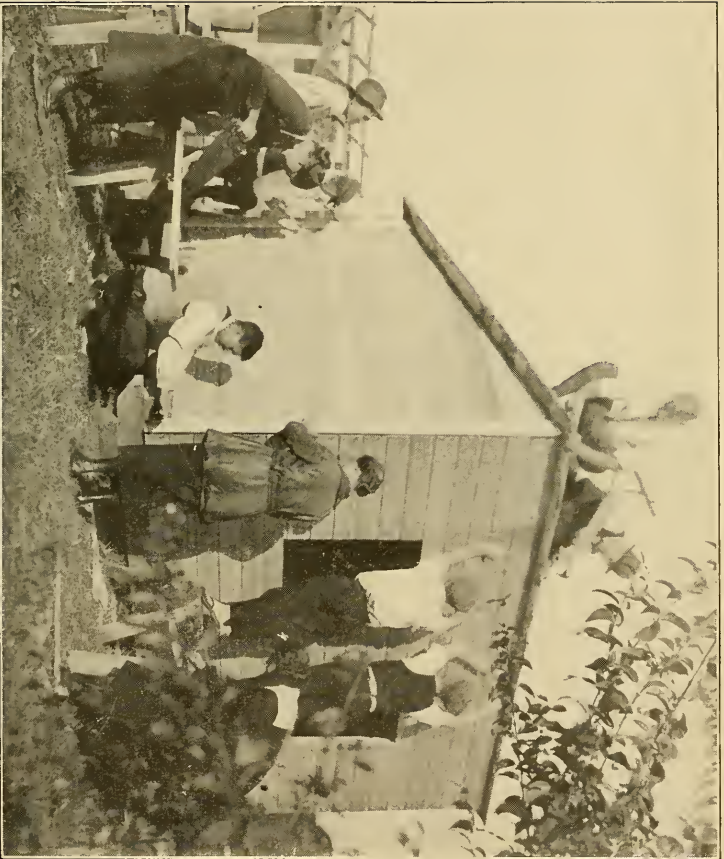
The successful commercial production of vegetables requires a clear understanding of the problems that the vegetable grower meets. Practical contact is made with the problem in so far as the season of the year and time devoted to the work permit. Classroom instruction makes clear the fundamental principles underlying the problem, and gives opportunity for discussion. The laboratory periods aim to give the student practice in applying the fundamental principles to the problems he is to meet as a commercial vegetable grower. Some of these



Mixing fertilizer



Studying field crops



Constructing a poultry house

will be discussed under the leadership of market gardeners and specialists.

Students electing this course are required to take soil fertility and it is recommended that they take botany and entomology. Three class hours and two two-hour laboratory periods a week.

Mr. Snyder

Ten Weeks Winter Course in Fruit Growing

A specialized course in fruit growing intended for persons who are interested in the growing of fruit for profit.

The work will require practically all of the student's available time while at the college and every student is expected to take all the courses offered.

Enrollment is limited to fifteen students.

Table of Required Courses

	Course	Class hrs.	Laboratory periods	Total credits
I	Tree Fruits	4	1	5
II	Pruning	2	2	4
III	Spraying	3	1	4
IV	Small Fruits	3		3
V	Harvesting and Marketing	2	2	4
VI	Farm Motors	3	2	5

Description of Courses

I. *Tree Fruits.*

A study of varieties, propagation, planting, fertilizing and soil management of apples, peaches, pears, plums and cherries.

Four class hours and one two-hour laboratory periods per week.

Mr. Roberts

II. *Pruning Tree Fruits.*

A consideration of the principles and practice of pruning the common fruits, including such questions as the methods of fruit bearing, the best season of the year for pruning, how wounds heal, dressings for wounds, formation of fruit buds, pruning tools, and care of top-worked trees.

Two class hours and two two-hour laboratory periods per week.

Prof. Van Meter

III. *Spraying.*

A study of spraying machinery (pumps, nozzles, hose and gas engines); the purchasing, preparation and use of spray materials; the best methods of applying; and methods of controlling the various pests of tree fruits.

Three class hours and one two-hour laboratory periods per week.

Mr. Raleigh

IV. *Small Fruits.*

Choice of varieties, methods of planting, cultural care, pruning, spraying, harvesting and marketing of raspberries, blackberries, currants, gooseberries, strawberries and grapes. Three class hours per week.

Prof. Sears

V. *Harvesting and Marketing.*

The handling of fruit from the time it is picked until it reaches the ultimate consumer, including picking, grading, packing, storing and marketing.

Two class hours and two two-hour laboratory periods per week.

Mr. French

VI. *Farm Motors.*

(As given by Rural Engineering Dept.)

Horticultural Manufactures

The utilization of culls and low-grade fruits and vegetables, and the marketing of excess crops are always serious problems to the producer. The economic conversion of these materials into palatable nutritious food products is becoming a greater necessity each year.

This course aims to place before the student the fundamental principles underlying the various means of food preservation and the manufacturing of food products.

The canning, drying, and storage of fruits and vegetables, together with the manufacture of many of their products, will be studied in detail, and the methods illustrated with laboratory exercises. Students will be given opportunity to do canning and drying, to manufacture many fruit and vegetable products, and to investigate storage conditions. The work in both classroom and laboratory will be of such a character as to be readily applied in the home or in the farm factory. Two class hours and two laboratory periods per week. Class limited to sixteen students.

Prof. Chenoweth and Mr. Robertson

The Supply and Marketing of Farm Products in Massachusetts

Marketing Farm Products.—A critical description of the methods of selling and handling farm products used by successful New England farmers and farmers' associations. Among the problems to be considered are those of grading, storing, transporting, factors influencing prices, and the importance of efficient marketing in increasing farm income. Two class hours per week.

Miss Foley

Botany

A study of the structure, functions, and diseases of greenhouse, garden, orchard, and field crops, together with methods of disease prevention, including spraying and the application of fungicides. Two class hours a week.

Assistant Professor McLaughlin

Entomology

The course in entomology covers the topics outlined below. It is aimed to cover the fundamentals of the subject rather fully. Time will permit the discussion of only the more important of the injurious and beneficial insects with which we have to deal in this section of the country.

1. Insects and their nearest relatives—how to distinguish them.
2. Structure or make-up of insects and the practical application of this knowledge in insect control.
3. Development, metamorphoses (changes), and stages of insect life.
4. Composition, preparation, combination, and use of insecticides, fumigants, etc.
5. Spraying apparatus and its use.
6. Beneficial and injurious insects.

A. The life history, habits, behavior and control of some of the most important insect pests.

B. Beneficial insects.

Three class hours a week.

Assistant Professor Alexander

Rural Sanitary Science and Hygiene

Significance of sanitary science in the relation to health; the theories of disease; air and ventilation; water and its protection; sewage disposal and purification; foods, their care, preservation, decomposition, and nutrition; vaccines and serum treatment; carriers of disease, immunity, and susceptibility; infectious diseases; disinfection and care of infectious diseases. Two class hours a week.

Professor Marshall

Agricultural Opportunities for Women

A course for the woman who is interested in agriculture and who wishes to know what opportunities are open to her in that field. A study will be made of the types of agricultural work for which women are best adapted; of the special

problems which will confront them in such work and how these may be met. Two class hours per week.

Miss Hamlin

HOMEMAKING

Owing to the increasing demand for instruction in homemaking provision has been made in the Winter School for a course combining homemaking with agriculture.

There are many women and girls throughout the State who are vitally interested in studying home problems and at the same time would like to become proficient in some phase of agriculture, as poultry, gardening, floriculture, or fruit growing. The college is able to extend this unusual opportunity.

Attractive laboratories equipped for homemaking work will be at the disposal of all women students in the Winter School.

Foods

When one realizes that a large percentage of the family income must be spent for food, it is easy to understand that this is one of the most timely topics of the day in the interest of thrift and health.

Special study will be made of the needs of the body and the selection of foods to supply those needs; also care in the handling and keeping of foods. Emphasis will be given to the application of fundamental principles in planning balanced menus. An unwise selection of foods may result in malnutrition rather than in health.

Consideration will be given also to such problems as infant feeding and school lunches. This course will include laboratory work of practical value. Two class hours and two two-hour laboratory periods per week.

Miss Knowlton

Clothing

Consideration will be given to making over and extending the use of fabrics as well as the selection of new materials. Their character, cost, and durability are studied with reference to planning a wardrobe for a limited income, emphasizing the beauty of simplicity and suitability. There will be practical work in sewing and making garments. Two class hours and two two-hour laboratory periods per week.

Miss Bartley

Millinery

The selection of color and form as related to the individual, the wardrobe, the occasion and the season will be given careful attention. Laboratory work will include covering of hat frames with velvet, silk, net and straw; lining and finishing; trimmings, bows, pleatings, hand-made flowers, together with pressing and renovating materials. One class hour and two two-hour laboratory periods per week.

Miss Bartley

The Business of the Household

Good management is a science. For generations women have failed to apply to the business of homemaking many efficient methods so successfully used in the business world.

Since the homemaker is largely responsible for all expenditures connected with the house, an important consideration in this course is the study of the family budget, the apportionment of the income, and the keeping of accounts.

Equally important is the standardization of household tasks, the study of systematic methods of work, selection and care of equipment, the use of time and labor-saving devices. Three class hours per week.

Miss Skinner

Home Care of the Sick

Health preservation and home care of the sick are of prime importance. It

should be far easier to keep well than to become sick, provided one understands the fundamental principles of hygiene, thus insuring the care of family health.

Every homemaker needs some knowledge of home care of the sick, including the study of simple diseases and their prevention, the care of young children and invalids, and first aid to the injured. Three class hours per week.

Miss Skinner

VOCATIONAL AGRICULTURAL TEACHING

The Massachusetts Agricultural College has been designated by the Massachusetts Department of Education as the institution for training teachers of vocational agriculture for the State. The work is being carried along the following lines:—

1. Regular college courses, four or five years, leading to a degree.
2. Shorter courses to supplement the training of more mature men who are partly qualified through practical experience, or through scientific study of agriculture, or through study of methods and principles of education, or through teaching experience.
3. Professional improvement training for employed teachers in regular college courses, courses in the winter term, or courses specially organized on request of a sufficient number of students.

The Winter Short Course period provides in part for the second and third lines. An intensive course during the first two weeks is provided for the instructors who may leave their teaching for only a brief period. This course may be continued on a higher schedule for such persons as may be able to remain throughout the winter term.

For all of these there will be an opportunity to take courses in general agricultural teaching, special Massachusetts problems, and agricultural subject-matter. An attempt will be made to furnish any subject-matter course which enough men may request.

High school principals and science teachers who have had farm experience, or practical agriculturists, may find this an opportunity to qualify for vocational teaching,—a field in which the demand is fairly strong.

The educational courses supplemented by an adequate amount of agriculture will be credited by the Department of Education towards approval of candidates or for professional improvement programs. Similar courses are offered in the summer school.

The following courses have proved to be of greatest benefit to those enrolled at this time:—

Principles and Methods of Teaching

The course is of most benefit to those who expect to teach or who are teaching. It covers some of the general principles and methods of teaching and their application to particular cases. This latter means a study of cases in school work, taken from actual experience, analyzed and illustrated by the class. Outside reading beyond the text in hand is required. By arrangement with the instructor, Winter School students may come into the regular class. Five class hours per week.

Professor Welles

Special Methods in Vocational Agricultural Teaching

This course consists of intensive work on the important principles underlying the successful teaching of vocational agriculture and a thorough study of the special plans and activities of the teacher of this subject. The job is analyzed to determine what the teacher must know as to character, setting, technique, and relations of his work. All available sources are consulted for information as to State requirements, industrial conformity, and professional ideals. Illustrative material showing how particular departments and schools work out their problems in this subject is gathered and studied. Plans for the year's work, unit study and daily lessons are worked out on the home-project basis. Special lessons are planned and taught by students in moot class.



Table decorations by the class in floriculture



A Course in the cooking school

In case both experienced and untrained men apply for this course, the group may be divided into two sections. Five class hours per week.

Professor Welles

Agricultural Teaching Improvement Problems in Massachusetts

A seminar course for employed teachers or directors of vocational agriculture, dealing with problems which constantly arise in the agricultural schools of the State. Prospective teachers may be admitted by special arrangement. Includes plans for the coming season, and campaigns for improved methods based on experiences and needs of men in service; for this season special emphasis on summer teaching of related subjects, and the proper approach to teaching a vocational topic.

Class meets for double periods five days each week for two weeks. The class will continue for a longer term at four days each week if there is a sufficient demand.

Mr. Heald

PRACTICAL AND SCIENTIFIC COURSE FOR FLORISTS

**MASSACHUSETTS AGRICULTURAL COLLEGE
AMHERST, MASS.**

January 4 to March 12, 1926

A special course for men and women engaged in floricultural work will be given at the Massachusetts Agricultural College beginning on January 4, 1926, and continuing through a period of ten weeks, closing March 12, 1926.

The course has been arranged in cooperation with the Boston Gardeners' and Florists' Club. The program of the course has been drawn up with the assistance of a committee from this club consisting of the following:

Harold A. Ryan, Retail Florist, Cambridge, Mass., Ex-President of the Club.

W. N. Craig, Horticulturist, Weymouth, Mass., Secretary of the Club.

W. H. Judd, Arnold Arboretum, Jamaica Plain, Mass., Ex-President of the Club.

Program of Studies

The work, as outlined by the committee in cooperation with the Department of Floriculture and scheduled for the coming term, is as follows:

1. Soils and fertilizers, covering the origin of soils, soil types, soil moisture, tillage, organic matter, humus, fertilizers, mixing and application of fertilizers, etc.

Mr. C. H. Thayer

2. *Commercial Floriculture*.—A brief consideration of greenhouse construction and heating, principles of greenhouse management, propagation, cultural methods and practices in the growing of the important commercial crops under glass.

Mr. S. C. Hubbard

3. *Garden Flowers and Bedding Plants*.—A study of annuals, biennials, herbaceous perennials, tender perennials, and bedding plants which are commonly used in commercial floriculture. Methods of propagation, culture, and uses will be considered.

Professor C. L. Thayer

4. *Floral Arrangement*.—A study of the principles underlying the arrangement and use of cut flowers and plants; basket and vase arrangements, table decorations; home, church, and other interior decorations; funeral designs and arrangements. This course will also include a study of color as applied to such work.

Assistant Professor R. T. Muller

5. *Insect Pests*.—A study of the insects injuring floricultural crops—how to recognize them and their work in different stages, their habits and life histories, conditions favoring their development, and the most effective control measures.

Professor H. T. Fernald

6. *Plant Diseases*.—The diseases attacking floricultural crops—how to identify them, how they grow and develop, cultural practices favoring diseases, and the methods of control.

Assistant Professor W. H. Davis

7. Special lectures by commercial florists, retail florists, gardeners, and others, on such subjects as greenhouse construction, heating, wholesaling, retailing, advertising, commercial crops, pot plants, bedding plants, perennials, design work, etc.

General Requirements

The number of students will be limited to fifteen. Applicants should register early, as they will be accepted in the order of their application. Students will have all the advantages and privileges of the Winter School.

No entrance examinations are required, but it is expected that every student will have a reasonable general education, especially in the English language, and that he will have had some practical experience in floricultural work. If possible, each student should present a personal recommendation from his employer or from some person of his acquaintance, showing the experience of the applicant in floricultural work.

The college reserves the right to reject any applicant obviously unqualified for the work, or to dismiss any student whose presence, for any reason, proves detrimental to other members of the school. Strict attention to the work of the course will be required of all students.

Those who complete the entire course with credit will receive the Winter School certificate of the college.

Expenses

	Low	High
Registration fee	\$5 00	\$5 00
Board (10 weeks at \$7.00)	70 00	70 00
Room rent (10 weeks at \$2.50-\$4.00)	25 00	40 00
Textbooks	10 00	15 00
	\$110 00	\$130 00

Information

For further information communicate with any member of the previously mentioned committee, with the Short Course Office, or with Professor C. L. Thayer, Massachusetts Agricultural College, Amherst, Mass.

WINTER SHORT COURSES IN DAIRYING

January 5 to February 27, 1926

STAFF OF INSTRUCTION, 1926

H. F. JUDKINS, B.Sc., *Professor of Dairying*
 T. G. YAXIS, M.Sc., *Assistant Professor of Dairying*
 H. L. PENDLETON, B.Sc., *Instructor in Dairying*
 M. J. MACK, M.Sc., *Instructor in Dairying*

In addition to the above, specialists in the commercial field will be secured to help with the laboratory work and discussion.



Nursery practice



Class work in greenhouses

CALENDAR, JANUARY 5, 1926 to FEBRUARY 27, 1926

- Course I. Testing Milk and Its Products, Tuesday, January 5, 8 a.m., to Saturday, January 16, 12 m.
- Course II. Milk Plant Operation, Tuesday, January 19, 8 a.m., to Saturday, January 30, 12 m.
- Course III. Milk Inspection, Tuesday, February 2, 8 a.m., to Saturday, February 13, 12 m.
- Course IV. Ice Cream Making, Tuesday, February 16, 8 a.m., to Saturday, February 27, 12 m.

GENERAL INFORMATION

A series of four ten-day courses in dairying will be conducted between January 5 and February 27, 1926. The courses cover the principal subjects connected with the handling of milk or with the making of milk products. Courses of this type were conducted in 1923 for the first time and they seemed to meet the demand for short course instruction along these lines, which has come in recent years from creamery, market milk, and ice cream plant operators and workers.

The course in milk inspection was offered for the first time last year and was the result of work with a committee of the Massachusetts Milk Inspectors' Association appointed to help organize such a course.

Many a plant manager, foreman, or worker would do better work and get more satisfaction out of his work if he understood the reasons for doing certain things. It is the man who wants to know more about his work, and who is anxious to become expert enough to advance in it, that plant operators can more profitably encourage to take these courses. Owners of dairy plants sending men of this type will profit principally through the fact that the men will learn economy of operation resulting in a saving of labor, and better handling and processing methods resulting in a better and more uniform product. The courses are purposely given at a time of year when help can most easily be spared.

The courses are intended not only for experienced plant men but for men having little experience. Those who are inexperienced should plan to take all of the courses. Farm men and women who are responsible for milk handling, butter making, or the making of soft cheese will also find these courses adapted to their needs.

The courses are so arranged that a student can report for the first on January 5 and take all the courses in succession, finishing February 27, or he can take any course separately. There are no prerequisites in any course. A certificate showing the subject studied is given at the end of each course to those doing satisfactory work.

Admission.—There are no entrance requirements except that the student must be eighteen years of age, and must have a common school education.

Registration.—Students should enroll by mail. A registration card will be sent upon application.

Enrollment for Course I, "Testing Milk and its Products" must be made by January 4, 1926. Those failing to enroll by mail may enroll on January 4. Students should arrive January 4, as classes begin at 8 a.m., January 5.

Enrollment for Course II, "Milk Plant Operation," must be made on or before January 18. Enrollment for Course III, "Milk Inspection," must be made on or before February 1. *Enrollment for Course IV, "Ice Cream Making," must be made on or before February 15 and should be made by mail by February 1, as it will be necessary to limit the size of the class if it gets too large. Those enrolling first will be given preference.*

All applications for entrance to these courses should be addressed to the director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

Upon arrival the student should report at the office of the Director of Short Courses in South College, telephone 424, for information concerning rooming accommodation.

Tuition, Fees and Expenses.—There is no tuition fee in connection with any of the courses, but each student is required to pay the Treasurer a registration fee of \$2. per course. This must be mailed with the registration card.

Students will need white suits for laboratory work, and may wish to purchase one or more textbooks for each course.

Board may be obtained at the college dining hall for approximately \$7. a week. Rent for furnished rooms in private houses varies in price from \$2.50 to \$4. a week for each occupant.

Positions.—The dairy Department is often called upon to recommend candidates for positions, and stands ready to recommend those who take these courses with the idea of getting positions, providing they are of good character, have good previous records, and do satisfactory work in the courses.

Methods of Instruction.—Instruction is given (1) by lecture, by recitation and discussion, and by the working out of problems; (2) by practical work in the laboratories. In general, two one-hour periods each day will be allowed for discussion and two three-hour periods for laboratory work. The student is expected to give practically the entire day from 8 a.m. to 5 p.m. to his work. The services of the entire department are available at different times for men taking these courses.

Flint Laboratory.—The dairy building is practically new, and with its equipment stands as one of the best college dairy buildings in the country. The testing laboratory is spacious and is well equipped for testing milk and its products. Equipment includes a Mojonnier Tester. About 1,000 quarts of milk are received daily, and the market milk department is equipped to weigh, clarify, pasteurize, cool and bottle this milk.

There is a ten-ton compression refrigerating system in the building arranged for making ice, freezing ice cream and cooling the ice-cream hardening box. The ice-cream room contains two brine freezers and one tub freezer, a mixing tank, emulsing and viscolizing outfits, a filling machine, and other smaller equipment. The butter department is equipped with power and hand churns of different makes, starter-making equipment, pasteurizers, and various makes of separators. The cheese room is equipped to make cheese of all kinds, and especially soft cheese.

DESCRIPTION OF WINTER COURSES

Course I. Testing Milk and Its Products (January 5-16).

This course is designed to fit men and women to test milk and its products in various kinds of dairy plants, or to supply some new information to those now engaged in this work. Those who do satisfactory work will be eligible to secure a state testing certificate.

Lecture and discussion topics include the magnitude of the dairy industry, secretion of milk and its composition, factors affecting the percentage of fat in milk, the sampling of milk, the Babcock test for milk and its products, the use of the lactometer, the acid tests, moisture and salt testing of butter, and total solid tests for condensed milk and ice cream, including the Mojonnier test.

Practical application of the lecture and discussion work will be carried out in the laboratory, and all the common tests of milk and its products will be performed.

Course II. Milk Plant Operation (January 19-30).

This course is designed to help milk plant employees to a better understanding of economy of operation and uniformity of product. It will help prepare men to be foremen and superintendents in milk plants.

Some of the lecture and discussion topics are: general scope of the market milk industry, value of milk as a food, relation of bacteria to milk, sanitary production, marketing, plant construction and selection of equipment, processing delivery, handling surplus, standardizing, grading and labeling, and care of milk in the home.

Laboratory exercises will cover milk sampling, the scoring of dairies, cream line problems, the scoring of milk, the study of milk plant equipment, milk processing, the manufacture of cottage, neufchatel, and cream cheese and butter.

Course III. Milk Inspection (February 2-13).

This course is primarily for the purpose of disseminating new facts to milk inspectors that they may get more satisfaction out of their work. Those contemplating becoming inspectors will also derive much benefit from the course. Lecture, discussion and laboratory work will cover the bacteriology of milk and its relation to the public health, sampling milk and ice cream and butterfat and total solid tests for same; tests for adulteration, study of farm practice in handling milk and methods of inspection, processing milk and inspection of milk plants.

Course IV. Ice Cream Making (February 16-27).

This course aims to present the most up-to-date information on ice cream making and fit men to operate or take charge of operating any part of the ice cream business.

Lectures and discussions will cover the selection of ingredients for the mix, standardizing and calculating the mix, processing the mix, factors influencing the yield, causes and remedies of ice cream defects, the manufacture of brick ice cream, special ice creams and fancy molds, marketing ice cream, and the handling of ammonia refrigerating plants.

Laboratory exercises will include work on the whipping properties of different creams, tests of ingredients used in the mix, study of ice cream equipment and its operation, calculating and making up of the ice cream mix, effect on the quality of ice cream of such factors as fat content, solids not included in the fat content, temperature of the mix, temperature of brine, age of the mix, speed of the dasher, treatment of the cream or mix, and making various kinds of frozen delicacies.

THE TWO-YEAR COURSE IN PRACTICAL AGRICULTURE

The Two-Year Course in Practical Agriculture is intended for men and women who desire a working knowledge of the best methods in farming but who cannot spend four years in college. An applicant for admission must be at least 17 years of age and must have a common school education.

Tuition is free to residents of Massachusetts; others are charged \$60.00 per term, or \$180.00 per year. All students must pay small laboratory fees in several courses.

The course is now organized that each student specializes along one of the following lines: animal husbandry, poultry, dairy manufactures, general horticulture, fruit growing, floriculture, or vegetable gardening. Each specialized course is intensive, with emphasis on practical work under competent supervision. It covers two winters and the intervening summer. The first year is made up of six months of study at the college followed by six months of practical farm experience on selected farms. Nine months more of study at the college completes the course. Each student, at graduation, receives a certificate showing the subject studied.

THE ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY

January 4, 1926, to December 18, 1926

Enrollment in the Vocational Poultry Course is limited to twelve students. Applications for this course should be made early.

The institution of the One-Year Vocational Course in Poultry Husbandry is to meet the needs of those who wish to specialize in this branch of agriculture and devote practically all of their time to it, and who feel they cannot spend either two or four years in college.

Entrance Requirements.—Applicants must be at least eighteen years of age and have a good elementary education.

Fees.—There is no tuition for residents of Massachusetts, but a laboratory fee of \$5 is required for the spring term, and the same for the fall term.

The material for this course has been carefully selected from the various courses for the four-year students. Use is made of the very practical portions, but enough of the more scientific work is given to enable the student to get a thorough grasp of the "whys and wherefores" of the subject. The former has been much enlarged upon, and an immense amount of practical laboratory work in care and management of poultry is required. "Learn to do by doing" is the slogan for this course. The aim is to develop as much skill as time will permit.

The general plan is as follows:—

Winter Term.—Students will take Courses 1, 2, and 3, and in addition will select enough work from the following departments to make the required number of credits:

Farm Management; Agricultural Economics; Microbiology; Pomology; Vegetable Gardening.

During the spring and fall terms the students will devote their entire time to the work in the Poultry Department.

Courses of Study.

Course 1. Elementary Poultry Keeping.—A textbook course supplemented with lectures, recitations, etc., covering the entire field of elementary poultry keeping, special emphasis being laid upon the following subjects: poultry house construction, feeds and feeding, breeds and breeding, incubation, brooding, growing stock, judging, culling, marketing, poultry farm management, and poultry diseases. Five recitations per week throughout the year.

Course 2. Introductory Course.—In this course the student will become thoroughly acquainted with the best literature on poultry through books, station bulletins, scientific articles, and magazines. A thorough discussion of the current problems of practical poultrymen is a strong feature of this course. Opportunities and possibilities of profitable poultry keeping in various sections of the country will be stressed. Two recitation periods per week.

Course 3. Poultry Diseases.—This course is planned for students specializing in poultry work. Anatomy and physiology of the domestic fowl are briefly considered, and particular attention is devoted to the diseases which may cause heavy losses in the flock. Prevention rather than cure is emphasized. Two recitations per week and one laboratory period.

Course 4. Poultry Farm Organization and Management.—This course will have to do with the study of the poultry farm as an organized business. Students having poultry farms of their own will use them as a basis for development. One or more trips will be taken to the representative poultry farms to secure information as a basis for comparison.

NOTE.—Course I will be supplemented by the following practical laboratory courses. The number of credit hours in each of these courses will vary with the subject matter and experience of the student.

Course 5.—This is a laboratory course covering fattening, killing, picking, and dressing poultry; grading and packing market eggs and a careful study of quality of both poultry and eggs.

Course 6. Poultry Judging and Culling. This course embodies the latest methods of judging egg production capacity by external characters as approved by the American Association of Instructors and Investigators in Poultry Husbandry; the history and evolution of our breeds and varieties of domestic fowl, their standard qualities, and their preparation, and judging for exhibition purposes. In the latter portion of the course the "American Standard of Perfection" is used as a text.

Course 7.—This is a laboratory course in incubation, brooding and growing stock. In this course, the student actually assumes the responsibility of brooding and growing one or more lots of chicks. It includes the preparation of the chick rations.

Course 8. Poultry Management.—A general poultry practice course in the care and management of poultry, the work to be done morning, noon and night, and other periods as necessity requires, the class to be responsible for the work in caring for specified flocks under the supervision of instructors.

Course 9.—This laboratory course covers poultry house designing, construction of houses and equipment and general repair work on a poultry plant.

THE SIX WEEKS' SUMMER SCHOOL

The Summer School at the Massachusetts Agricultural College has been a feature of the short course work for the past eighteen years.

In 1924 for the first time the school was operated on a college credit basis, only graduate and under-graduate work being offered.

For 1926 the Summer Session will begin July 6 and close August 17. The following courses were offered during the past summer:

Collegiate Courses

Education

Home Economics

Science and Allied Subjects

Freshman and Preparatory Courses

Sub-freshman courses for college entrance credit:

English, Algebra, Composition

Courses in Education and Allied Subjects

Methods of Teaching English in the High School

Methods of Teaching and Supervision of Mathematics

General Psychology

Advanced Educational Psychology

Tests and Measurements

Modern Philosophy of Education

Content and Methods in Social Studies in High School

Principles and Methods of Teaching

Special Methods in Teaching Vocational Agriculture

Supervised Teaching

Principles of Secondary Education

The Employed Teacher of Agriculture

Vocational Education

Courses in Home Economics

Clothing

Foods

Millinery

Methods of Teaching Home Economics

Nutritional Phases of Health Education

Textiles

Science and Allied Courses

Food Preservation

General Science

Studies in Science

Public Health

Dramatic Presentation

Design and Practical Arts

Flower Growing

Botany for the Teacher

Cultivated Trees and Shrubs

For catalog, write Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

TEN WEEKS' WINTER SCHOOL

THE MASSACHUSETTS AGRICULTURAL COLLEGE

Application for Enrollment

I hereby make application for admission to the Ten Weeks' Winter Courses which are to begin January 4, 1926. I am enclosing the registration fee of five dollars (\$5) in cash, check, or money order. (Designate which one.)

Name (Mr., Mrs., or Miss).....

Home address

Present occupation

Date of application.....

My choice of courses is as follows:—

1..... 3..... 5.....

2..... 4..... 6.....

.....

Kindly give us the names and addresses of two persons to whom we may refer for a statement of character.

1.....

2.....

Mail this blank, enclosing fee, to Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass. Checks or money orders should be made payable to the Massachusetts Agricultural College.



